The American CINEMATOGRAPHER

A·MAGAZINE·FOR PROFESSIONALS AND·AMATEURS

In this number

PHOTOGRAPHING *an* ECLIPSE
CAMERA MOVEMENT
ELEMENTS OF MAKE-UP

PRICE 25c

AUGUST
1932

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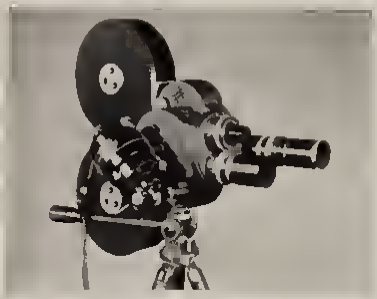
(At left) Martin Johnson in Africa with two of his B & H Professional Cameras



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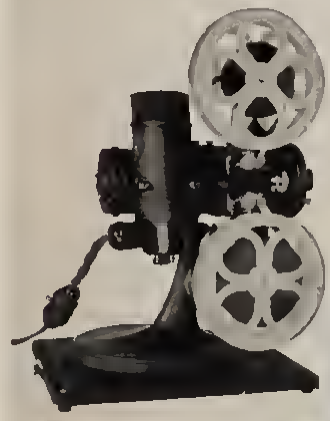

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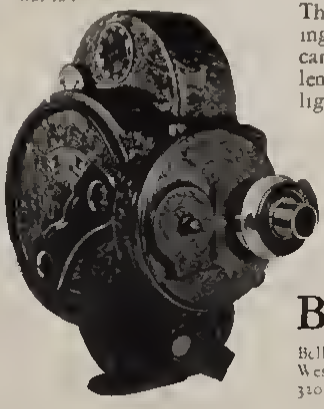

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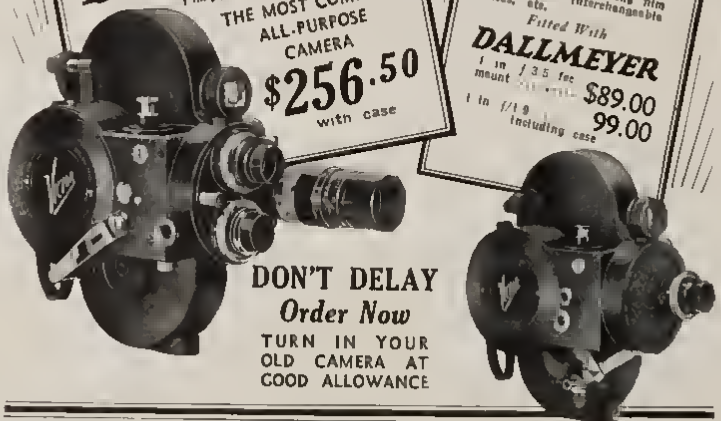

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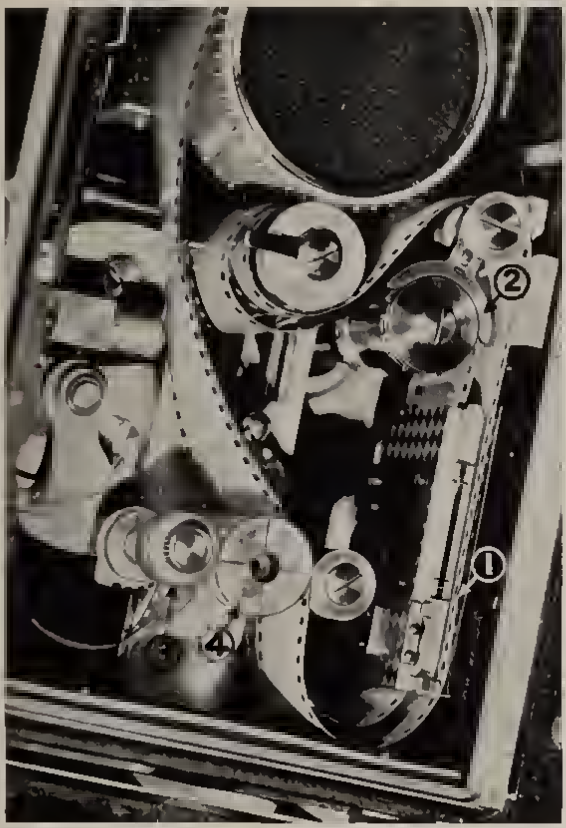

1 *Picture film is offset at recording point to clear the recording light beam, insuring a sharp well defined sound track impossible to obtain when two films are run in direct contact*
Sound Film in its passage through recording unit and over filtered sound sprocket cannot be disturbed by the picture film

2 *Full film shoe holds sound film in positive engagement on the sound sprocket*

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4 *When using single system small feed sprocket between recorder and film movement removes intermittent film flutter before passing the film to the recorder*

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Technical Accuracy for Motion Picture Sets

by **HARRY REYNOLDS**
Mechanical Design Dept., Paramount Studio

ONE of the most important objectives in the making of motion pictures is the creation of an illusion of complete realism. This is nowhere more apparent than in the design and fabrication of the settings before which the action is played. The photographing of this action is the focal point of the efforts of the entire studio personnel, the technique of everyone concerned—writers, directors, players, cinematographer, and all others—is keyed to realism; and if the set upon which their activities culminate does not equally express this mood, their work is proportionately affected. This need for accuracy has become increasingly vital with the world-wide spread of amateur motion picture photography, where, a few years ago there might be one person conversant with the possibilities of the camera, now there are hundreds of thousands who, seeing a palpably artificial set, will say, "Why didn't they photograph the real thing? They could—for I could do it myself."

This is especially true in the case of such specialized settings as ships, trains, and aircraft—all of which occur with some frequency in the course of ordinary production. Such backgrounds cannot be merely the product of a gifted architect or art-director, but must be designed by architects who are also engineers and specialists in marine, railway or aerodynamic design. Without this specialized skill in the design of such sets, the ordinary art-director (however skillful he may be as an architect) will almost invariably, in his efforts to enhance the pictorial qualities of the picture, commit some technical faux-pas, inserting some detail that could not possibly be there in actuality, or omitting some detail that would, in reality, have to be there. In either case, the effect would be the same: the illusion of reality would be lessened, or even destroyed, for some part of the audience. It might not be so important if but one sailor, or one railroad-man, or one aviator noticed the flaw but with perhaps two hundred release-prints of a picture on exhibition, each playing to four or five audiences daily, our one man multiplies himself into thousands whose pleasure is lessened, and whose opinion of the production, the star and the company suffers through one technical incongruity.

I am convinced that the only way to efficiently avoid such incongruities is to have two art-directors in charge of productions requiring such sets: one to design the normal settings and the other to have complete charge of the design and construction of these specialized sets which require technical details unfamiliar to the ordinary architect. Such a man would necessarily have to be experienced in architecture, in motion-picture technique, and in the technical details of marine architecture, railway construction, and aircraft design. In this manner, the company would achieve a saving of time, of effort, and of money in addition to the assurance of technical accuracy in the sets.

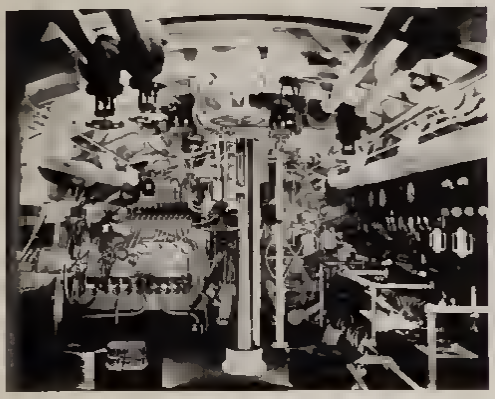
Such a policy has to a limited extent been in effect at the Paramount Studio during the production of certain pictures requiring such specialized sets recently. The Art Department has handled the normal sets in the regular manner, while the Department of Mechanical Design and Construction designed and executed the special sets, in cooperation with the supervising art-director. Although the plan has been operated in only a limited degree, it has nevertheless effected considerable economies. Were the two types of sets to be handled by the respective design-staffs independently, I am confident that even greater economies would be achieved.

Such a policy would be in complete accord with the recognized policies of studio management, as it would not entail duplication of work or personnel, but merely highly desirable specialization. A parallel may be found in the photographic work: one department handles the regular production camera work, a second, special-effects and miniatures, and a third the highly-specialized transparancy process; and cameramen assure me that it could not be otherwise.

An interesting example of specialized settings created under this specialized designing arrangement are those used in "Devil and the Deep," which is now in production. A great deal of the action takes place within a submarine, and, of all naval architecture, submarines require the most specialized design. Therefore, the design and construction of the settings for this sequence was turned over to my department. I, in turn, entrusted the project to one of my associates, John Goodman, who is without doubt the most profound student of marine architecture in the motion picture industry. Inasmuch as I knew that Mr. Goodman had been responsible, both as an art-director and an engineer, for the ships in "Old Ironsides," "The Divine Lady," "Code of the Sea" and many other maritime films (both earlier and later than these,) I knew that the designs would be both accurate and photographically suitable. I was not, however, prepared for such outstanding designs as he produced, for, in consequence of the extreme reticence of the Navy Department on all matters pertaining to Submarine Service, neither he nor the studio Research Department had much material to work with. None the less, as the illustrations show, he produced a set which submarine men have assured me is 100 per cent accurate in every detail.

The action of the story required the main control-room of the submarine, the crew's quarters, and the forward torpedo-room. Since the action required that these be flooded, to represent the sinking of the submarine, few makeshifts in construction were possible. Furthermore, the "stock shots" to be used in the picture, showing the submarine running on the surface and diving, showed a boat of the "S" class of the U. S. Navy, there were many restrictions in design, it would not do, naturally, to show shots of an "S-boat," and then use interiors of the far earlier and smaller "R" class, or the more recent, and far larger "V" class. Fortunately, we found in the studio a man who had served not only in the submarine service, but actually on an "S-boat." That simplified matters to a great extent, in so far as technical details went, so between this assistance, and the meagre material in the way of photographs and drawings of submarines that were available, we produced a setting so perfect that, on the screen, I am confident, many Navy men will recognize their own ship—and wonder how in the world we got permission to use it!

Due to the nature of the action, we built the set complete, in fact, we virtually built the forward half of a regulation



Main control room of a submarine as built in the studio

submarine The material chiefly used was steel it had to be, not only to give the requisite appearance, but to give sufficient strength to withstand the sudden rush of water as the boat is rammed and sunk, some of the compartments had to be flooded four or five feet deep with very real water! Obviously wood and plaster construction would not do for this purpose We were all of us rather doubtful as to the effect of this box-like steel construction on the sound-apparatus, but the sound department assured us that they could record satisfactorily on our set, and such of the rushes as we have heard have been entirely satisfactory

In order to enable the set to be properly photographed, of course we had to omit the hull plates on the upper third of the cylindrical hull We built the reinforcing bulkheads, however, and as these were spaced exactly as though they were on a bona fide submarine, they presented the proper openings for the lights, yet masked each other perfectly, maintaining the desired illusion of actuality As I have stated, the three compartments were built together, exactly as they would be in building an actual submarine Part of the after compartment—the control room, which is in about the middle of a real ship—was removable, being mounted on rollers and rails, so that it could be moved out of the way when working in the crew's quarters This proved to be a highly practical arrangement, as it facilitated the photographic work greatly, in the future, if such settings are again needed, we will know from experience that this sectional method of construction is the most economical

The various fittings on the set were bona fide all of the instruments—compasses, inclinometers, bank indicators, depth-gauges, air and water-pressure indicators, engine-room telegraphs, etc —were obtained from various marine instrument firms The controls—horizontal and vertical steering wheels, electrical controls, etc —were fabricated in our own shops to authentic design The many valves on the maze of air water, ballast and fuel pipe-lines were regulation marine valves, obtained from local ship-fitters. The several periscopes were practical, and made—complete in all external details—in our own shops. In a word, our setting could very nearly be used in a bona fide submarine

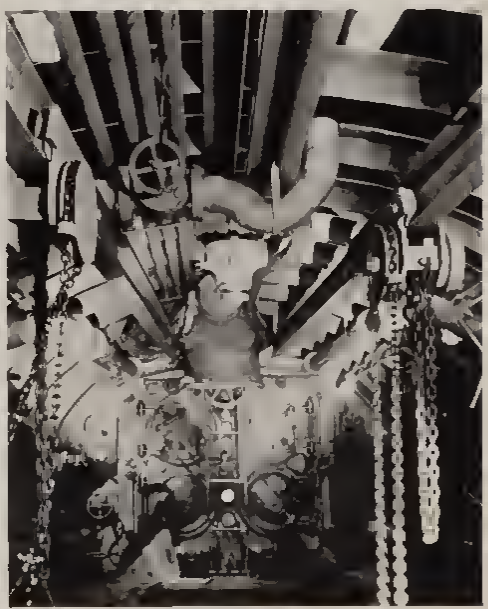
It is natural to think of a submarine as a small craft, and hence to conclude that a motion picture set representing only a part of a submarine as being a small structure This is far from being true. our set—which represented approximately one third of the craft—measured 110 feet in length by 20 feet in beam, and nearly ten feet high Of course, we made every effort to save both weight and cost in the construction, still, the completed set, being made largely of steel, weighed several tons, and the cost was considerable The results achieved on the screen, however, have proven eminently worth the effort and money expended

But it is not alone in such intensely specialized settings as submarines that this specialized technical design is demanded The construction of settings representing ordinary surface craft, railroad trains, and aircraft, likewise require specialized knowledge generally outside of the experience and training of the average art-director or architect Frequently pictures require settings representing the interior of an ocean liner, for instance Despite the palatial hotel-like decorations of modern liners, there are a thousand and one little details which can only be known to a close student of marine architecture and it these details are inaccurate, the set is in proportion a failure, for such inaccuracies tend to tear down the illusion of actuality For example, in a recent production from another studio, in which the entire action transpired on a de Luxe liner, one of the major settings represented the stairway in the First Class passenger quarters It was an artistic setting, but showed one glaring inaccuracy, which anyone who had travelled by sea would quickly notice half way up the stairway was a landing, and from this landing was the door to the cabin of one of the principles Such a thing is an absolute impossibility in marine architecture The deck-lines of a ship must for vital engineering reasons, be straight and unbroken from stem to stern placing a cabin that way, between two decks, would break this deck-line, seriously weakening the entire structure of the ship!

In another instance—a picture now in production at our own studio—the script called for a third-class cabin on the S S "Ile de France" The director wanted the cabin to be definitely third-class, yet not too cheap looking He suggested, as one way of gaining this end, making the cabin a legitimate third-class one, and the corridor from which it gave, a second-class one This, of course, was incongruous Finally, the workers in my department found that the corridors on such ships—first-class, second-class and third-class—are practically identical, solving the problem very nicely

Similar problems constantly occur in the making of such productions No one can possibly impugn the abilities of

(Continued on Page 27)



Interior of torpedo room of submarine constructed in the studio.

The Duplication of Motion Picture Negatives

by **J. I. CRABTREE** and **C. H. SCHWINGEL**
Communication No 455 from the Kodak Research Laboratories

(Continued from Last Month)

IV. FACTORS AFFECTING GRAININESS DURING EXPOSURE AND DEVELOPMENT

IN THE foregoing tests the graininess of the original negative exerted a pronounced effect on the graininess of the duplicate negatives and prints In order to eliminate this effect and to determine the influence of exposure and development on graininess, the following tests were made

Lengths of the various films tested in Table I were given uniform flash exposures and developed by the rack and tank method The degrees of development were determined from step tablet readings from exposed strips developed on the racks with the flashed films The negative types of material were developed in the borax developer D-76 and the positive material in the positive developer, formula D-16

It has been found throughout this investigation that whenever a negative emulsion was developed in a positive type of developer, graininess was greater than when the material was developed to an equal degree in the borax developer The borax developer is not suitable for positive development, however, because of its inability to produce the necessary high gamma

The graininess of the developed flashed strips was judged by the method described for all preceding tests In these observations the assumption was made that the graininess of the photographic material was proportional to the distance from the eye of the observer to the screen

Since the visual acuity of the observer was subject to variations due to such factors as adaptation level, fatigue, and general physiological conditions, allowances were made for these whenever measurements were made

Before making measurements, the person chosen for the viewing was allowed to remain for a length of time in a room which had an illumination level approximating that encountered when viewing the screen This preliminary precaution was necessary in order to fix the adaptation level of the observer and minimize errors arising from variations of this Numerous check determinations were made and in no case were values found which deviated more than 10 per cent

Each screen test consisted of the projection of not more than 225 feet of film to be viewed, after which the observer was allowed to rest for a period of ten to twenty minutes before continuing In this way errors arising from eye fatigue were minimized.

The values for graininess reported were the result of a large number of observations made by three observers of normal eyesight, which were averaged when drawing the curves

A. Variation of Graininess of a Constant Density with Degree of Development

Lengths of the flashed film were developed for varying degrees to give gammas covering the useful range for each of the emulsions used The exposures were varied to give a density of 0 8 in every case The graininess ratios determined by projection were plotted against the gammas to give the curves shown in Figure 1 The results show that for negative emulsions the graininess increased very rapidly with increase in the degree of development, while for the positive types of film the graininess rapidly reached a maximum and then remained practically constant, or even decreased slightly with increasing degrees of development, over the useful range of the material

These results seem to show why the method using a high gamma master positive and a low gamma duplicate negative, which were printed on positive and negative emulsions respectively, gave less graininess than the earlier recommended method in which both master positive and duplicate negative were printed on a negative emulsion and developed to a gamma of unity

These experiments also confirm those of Carlton and Crabtree[6] who predicted that "the graininess-gamma curve for a negative material over the useful range of gamma (0 5 to 1 0) is probably straight and rather steep, while the graininess-gamma curve for the positive (gammas 1 2 to 2 2) has a long shoulder which must be almost parallel to the gamma axis"

For this discussion it can be assumed that the graininess of a print is the additive result of the inherent graininess of the master positive and duplicate negative materials, although actually it appears to be somewhat less than this total The graininess ratio of a flashed length of duplicating negative film, emulsion series 1505, developed to a gamma of unity was approximately 5 5 units, and a print from this on the same material and developed to a gamma of unity on this assumption would therefore have a graininess approximately double this, or 11 units Considering a second example where the master positive was printed on duplicating positive film, emulsion series 1355, and developed to a gamma of 1 85 when the

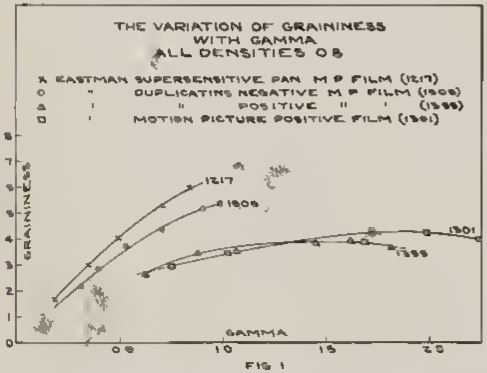


FIG 1

The variations of graininess with gamma all densities 0 8.

6. **Crabtree, J. I., and Carlton, H. C., Some Properties of Fine Grain Developers for Motion Picture Film, Trans. Soc. Mot. Pict Eng., No. 38, 406, 1929.**

graininess ratio was approximately 3 8 units and then printing the duplicate negative on duplicating negative film, emulsion series 1505, developed to a gamma of 0 55 which furnished additional units of 3.8 (see curve in Figure 1) it is seen that the duplicate negative would have a graininess ratio approximating 7 6 units It is apparent, therefore, that the graininess should be much less in the case of a duplicate negative prepared by the latter method than one prepared by the former method

In Figure 1 the graininess curve for duplicating positive film is contrasted with that of motion picture positive film for the purpose of showing that the graininess ratio is lower for the duplicating material at high gammas

B. Variation of Graininess With Density

Lengths of film were given varying flash exposures and developed to the gammas recommended It was considered that the graininess could not be judged correctly from these because of the varying screen brightness, so prints were made on motion picture positive film from the various densities, and exposed so as to give a density of 0 8 with equal degrees of development

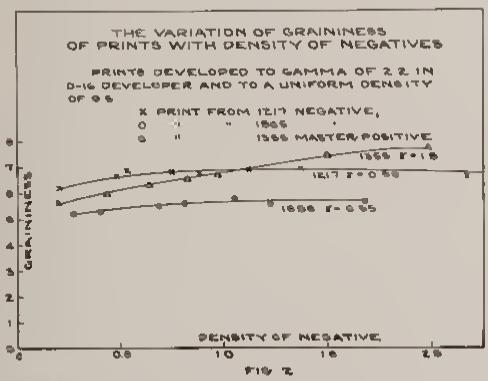


FIG 2

Variations of graininess of prints with density of negatives. Prints developed to gamma of 2.2 in D-16 developer and to uniform density of 0.8.

The graininess ratios of these films were determined and plotted against the negative densities to give the curves of Figure 2, which show that for the master positive the densities should be as low as possible on the density scale, while in the case of the duplicate negative printed on negative materials, the graininess increases only slightly with increase of density of the negative It is also seen that the graininess of Eastman Supersensitive Panchromatic film is greater than that of Eastman Duplicating Negative film, but the curves run parallel to one another

V. FACTORS EFFECTING GRAININESS DURING PRINTING

A. The Effect of Loss in Definition on Graininess

Tests were made to determine the effect on graininess of imperfect negative-positive contact in printing These were accomplished in two ways (a) by adjusting the printer gate so as to permit the negative to be out of contact with the positive stock during exposure, and (b) by printing through a thickness of Kodaloid

The results were similar in both cases and showed that whenever a loss in picture definition occurred there was also a diminution in graininess The slight loss in picture definition was not objectionable in certain types of prints, particularly with close-ups where fine detail was not essential.

B Effect on Graininess of Printing With Diffuse Light

The gate of a motion picture step printer was fitted with a piece of pot-opal glass in such a manner as to insure perfect contact between the glass and the negative during the printing operation This arrangement permitted the printing to be carried out with diffuse light Duplicate negatives and prints from these and from original negatives showed no appreciable difference in graininess, although printing with diffuse light slightly impaired the picture definition.

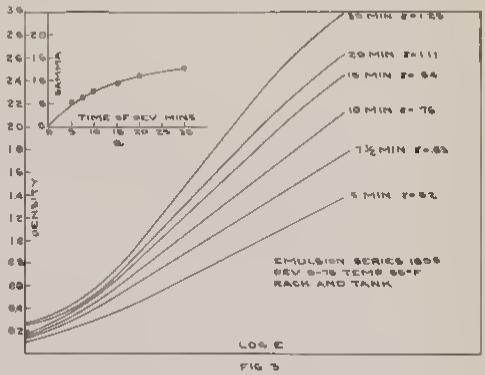


FIG 3

Characteristic curves for Eastman duplicating negative, series 1505, developed in D-76 at 65° F by rack and tank method.

VI. TONE REPRODUCTION

The photographic characteristics of emulsion series 1505 are shown in Figure 3 from which it is seen that at the low gamma required for duplicate negatives (0 5-0 6) it was possible to print to a minimum density of 0 3 and still retain all the negative densities on the straight line portion of the characteristic curve, which is the requirement for correct tone reproduction For higher gammas it was necessary to increase the minimum density values

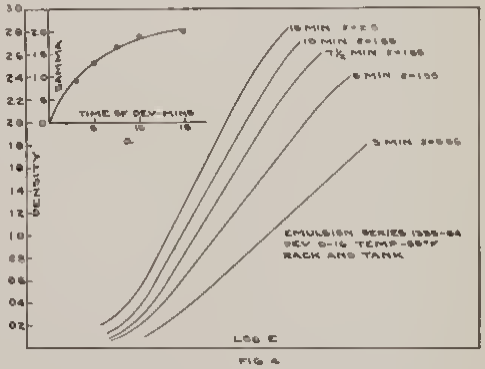


FIG 4

Characteristic curves for Eastman duplicating positive, series 1355, developed in D-16 at 65° F by rack and tank method.

Emulsion series 1355 (Eastman Duplicating Positive film) was found to be the most suitable material for use in the making of the master positive Its latitude permitted the use of the high gamma (1 85) without impairment of the tone reproduction Owing to the great density range to be covered in the master positive for best gamma conditions, no other

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Cinematographers and Directors Meet

Discuss Camera Trucking Problems

by **HAL HALL**

FOR many weeks there has been much discussion among Hollywood cameramen and others over the problem of "trucking" shots Ever since Rouben Mamoulian's picture, "Applause" appeared with a multitude of shots in which the camera performed acrobatics, directors in Hollywood have been practically going wild in an attempt to inject moving camera shots in their pictures, with the result that many pictures seem to have been made with the camera constantly on the move, and many pictures have come out with photography considerably lowered because of these efforts This has caused no little concern among the cameramen who conscientiously attempt to give the finest of photography in all productions

In an attempt to correct some of the perambulating, or trucking, abuses, the American Society of Cinematographers called a meeting on the evening of July 19 at the projection theatre of the Paramount Studios. To this meeting were invited a large group of outstanding motion picture directors, and the meeting developed into one of the most interesting and perhaps beneficial of any held by this organization in many years

Five reels taken from three productions made by major companies were shown, illustrating the trend among directors toward the trucking of the cameras In these reels appeared some examples of camera trucking that were so absurd as to positively spoil the picture In fact in one instance it seemed as though the director must have looked at an example camera trucking and then had started out to show Hollywood that he could have his camera run around the set, too It is just such instances as this that the cameramen wish to correct for the good of photography and for the saving of money and time in production cost

Following the showing of these reels, Mr Mamoulian was called upon to give his views on camera movement Mr Mamoulian, who really started the camera movement vogue, very clearly gave his views and reasons for camera movement

"I do not feel," said Mr Mamoulian, "that I have been in the picture industry long enough to be qualified to discuss this subject before you man who have spent so many years in it When I came into the picture field I spent considerable time in looking over the situation and a careful study revealed to me the fact that while this is the youngest of the arts, it, nevertheless, seems to have the most traditions I have never seen an art in which there are so many things that you cannot do in any other way than has been done throughout its past. It seemed to me that there was little thinking in the industry, and that if a man advanced a new idea he was frowned upon and told that it could not be done because it had not been done before

"I early came to the conclusion that the most important factor in the making of pictures was the camera It seemed to me that the camera was being neglected, that it was being confined, that it was being ruled by the law of the tripod, which kept it stationary, and that it was being used only as something to dispassionately record just what was before it I thought that the camera should be given the opportunity to really be a live and breathing factor in the making of pictures That it should be allowed to get off the tripod and do the things that it was capable of doing And so I used the trucking shots.

"Without doubt, trucking shots have been abused and overdone And, unless intelligent thought is given to trucking shots they are useless and unnecessary I think that the camera should move—but only when necessary, only when by movement it will enhance the value of the picture There are times when a trucking shot will make of a drab scene a vitally powerful one Then the camera should move Moving shots just for the sake of moving shots and with no reason are silly But I believe that by taking the camera from the tripod we can, in many instances, add power and punch to the scene In cases such as that a director should have the camera move by all means"

He then pointed out that while the direct cut from one scene to another might cost less, that a trucking shot would serve better to hold the story together and in many cases maintain the atmosphere that the director wishes to keep unbroken But—he urged that no moving shots be made without the most intelligent of thought beforehand, and that none be made that would not prove more valuable to the scene than the direct cut shots

John F Seitz, Past President of the American Society of Cinematographers, then spoke briefly He reviewed the history of cinematographic technique and pointed out that with the arrival in this country of "The Last Laugh" and "Variety"—in the silent picture days—the fad of acrobatic cameras came into vogue for a time with the apparent idea of trying to see who could make the most fantastic appearing pictures This, he pointed out, was dropped with the coming of sound and the old technique returned until the present fad of trucking made its appearance He pointed out the dangers of falling into the habit of making moving shots without reason to the point where pictures would be ruined, both photographically and otherwise

Victor Milner, A S C, then spoke quite spiritedly on the subject He declared that from the examples that are appearing in our theatres today it would seem as though many directors were having the cameras run around the sets solely to show that they, too, can have moving shots in their pictures, and with no other reason apparent He then pointed out the difficulties placed before the cameramen in the matter of lighting for these shots; and explained that many times a cameraman appears on the set at the start of the day and arranges the lights for the scene called for, only to have the director walk in later and call for a trucking shot that makes it necessary to relight the entire set—thus causing delay and increased cost of production He pointed out that photography must suffer when one has to light the set so that it can be photographed from practically all angles and in every nook and corner without a change of light placement

Mr Milner then declared that so much movement—in many cases—done so much that it is obvious to anyone looking at the picture that the camera is moving will hurt the picture and will be reflected eventually at the box office He declared that many of the moving shots are so trying on the eyes that theatre patrons complain of eyestrain because of them

Paul Allen, A S C, then declared that he knew of one case in a studio where the director decided upon a trucking shot, and said that it took three days of rehearsal before this scene could be shot He called attention to the increased cost this must have added to the production

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New 16 mm. Camera from Eastman

Gives a Picture 8 mm. Wide

A MOTION picture camera that quadruples the number of images recorded on a given length of 16-mm film, and thereby makes every foot of film go four times as far, has just been announced by the Eastman Kodak Company.

Small enough to fit in a coat pocket, the newly designed Ciné-Kodak Eight holds 25 feet of 16-mm film but takes enough pictures on that length to run four minutes on the screen—equal to the projection of 100 feet exposed in other cameras using 16-mm. film. The Cine-Kodak Eight will save makers who use it nearly two-thirds of film cost

The new development in home movies is consistent with an Eastman policy effective since the early eighties—reduction of the expense of amateur photography to make it available to an increasingly large group without sacrificing the interests of "advanced amateurs" who desire to continue using the more elaborate equipment

The Cine-Kodak Eight, equipped with a Kodak Anastigmat F 3.5 lens, is the lightest, smallest home movie camera with a film capacity permitting four minutes of projection The low cost of both the apparatus and the film, together with the novel compactness and simplicity of the equipment at no sacrifice of convenience, should be of interest to that large group of persons who wish to make movies but who feel they cannot afford the special features of 16-mm equipment

The quality of the resulting motion pictures is pronounced very high by persons who have seen them projected in Rochester More than two years of direct experimentation will have preceded the appearance of the Cine-Kodak Eight on the market

An entirely new method of distributing on the film the sixteen photographic images taken per second is embodied in the Ciné Kodak Eight The new camera loads with a 25-foot roll of special 16-mm film, but it exposes only half the width of the film at a time, recording a series of complete images on each half When the 25 feet have run through once, the spool containing the film is removed and placed on the supply spindle The other half of the film is then exposed The width of each image being thus reduced by half, the height is similarly reduced and the number of images down the length of the film is doubled in consequence Each exposed half of the 25-foot roll contains, therefore, as many pictures as a 50-foot roll exposed in other cameras using 16-mm film, and the whole 25-foot roll contains as many pictures as 100 feet from the larger home movie cameras

When the exposed film reaches a processing station, it is processed, slit down the middle, spliced end-to-end, and then returned to the movie maker as a 50-foot reel of 8 mm film with perforations down one side Perforations on the special film for the Ciné-Kodak Eight are spaced half as far apart as on other 16 mm. film

The new Eastman movie camera.

The special 25-foot rolls of 16 mm film prepared for the Ciné Kodak Eight are said to have an extremely fine-grained panchromatic emulsion that assures a clear, sparkling screen image in spite of great magnification A black coating on the back of the film reduces the possibility of halation The film rolls are small enough so that several may be carried conveniently in a pocket As in the case of other 16 mm film, the price of rolls for the Cine-Kodak Eight will include processing—and also the additional work of slitting and splicing the 16 mm width into 8 mm

Two Kodascope Eights have been designed for the projection of the new 8 mm movies They will be put on the market

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At left, image on 35 mm film Next, on 16 mm. Next, the 16 mm film after passing through new camera with 2 rows of images Right, the film after being split into 8 mm width

The Coming Eclipse

And Some Timely Advice on Photographing It

by **CHARLES G. CLARKE, A.S.C.**

THE eyes of the scientific world are now being riveted upon Eastern Canada, Vermont, New Hampshire and Maine because of the total eclipse of the sun which will be visible in that region on August 31, 1932. Many parties from observatories will be making records along the path of totality, and scores of professional and amateur photographers will be getting cameras ready for the eventful day.

We often witness an isolated cloud casting a distinct shadow on the surface of the earth while the sun is directly illuminating the landscape around the spot. If the cloud is in motion, the shadow will move. This is, in reality, a miniature eclipse of the sun. In the real eclipse such as we will see the last of this month the moon takes the place of the cloud and totally obscures the sun.

Of all celestial phenomena, none have in the past made so deep an impression upon the minds of men as has the total eclipse of the sun. Often it has been looked upon as something supernatural, a direct manifestation of Divine wrath. Mathematical science may have banished this superstition, but the spectacle is still one to impress the beholder. The earliest record of an eclipse is reported in an ancient Chinese classic, "Shu Ching," as taking place on October 22, 2137 B. C.! Another was visible in southern Babylonia on July 31, 1063 B. C.

The successful prediction of an eclipse is really a triumph for the mind of man, and one of the test questions put to nature, on the reply which depends largely in the certitude of truth and conviction of reality. I do not know of any department of science where man has made more glorious conquests. For example, it is known now that there will be a total eclipse of the sun visible over Paris on June 4, 2160, long after you and I have passed on. So accurate is mathematical astronomy in predicting eclipses that the eclipse which will be visible at Los Angeles on August 12, 2045 is so well understood that we could set our cameras and instruments now with absolute precision. Future eclipses now predicted include one on February 14th, 1934, visible in Borneo, June 19, 1937, visible in Peru.

There are three types of eclipses: total, annular and partial. Due to the fact that the orbits of the earth and moon are both ellipses and not circles, the distance between the sun, earth and moon will vary considerably and the length of the moon shadows will change proportionately. Thus, when the sun is close and the moon far from the earth an annular eclipse is produced. When the reverse we have a total eclipse. In an annular eclipse a ring, or annulus, of light appears around the edge of the moon, such an eclipse is shown in Figure 2. The sun is seen gleaming through the valleys of the mountains of the moon, producing these spots of light which are called Bailey's Beads.

At the time due for the eclipse there will be found upon looking at the sun through smoked glasses, or black photographic film, a small nick in the north-west side. This is produced by the moon as its east side starts between the earth and sun, the moon starting to hide the disk of the sun. After an hour has passed the sun will appear as a crescent with the horns of the crescent towards the north-west. An interesting effect may be noticed at this time. If the observer is standing near a tree where the sun-light filters through the foliage, it will be seen that every little spot of sun-light on the ground is in the form of a small crescent. The small openings between the leaves are as pin-hole cameras and produce optical images on the ground of the eclipsing moon and sun. About ten minutes before totality the darkness begins to be quite pronounced. The disappearing light becomes changed in quality, it has a pale, ashen hue and differs from sun-light of normal conditions. The landscape, mountains and ocean have a peculiar, unearthly pale appearance that cannot be discerned at any other time. Meanwhile, the surrounding country becomes darker and darker. Sometimes as early as five minutes before the time of totality

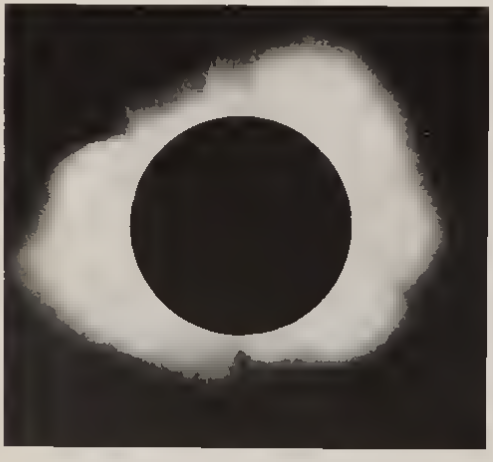

Fig. 1. Total eclipse, showing Corona.

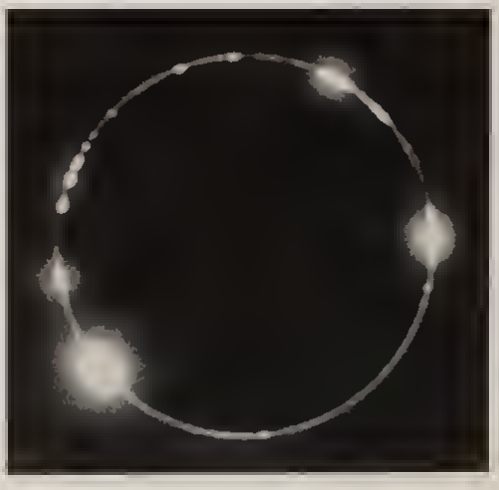

Fig. 2. Annular eclipse, showing Bailey's Beads.

the mysterious "shadow bands" may be observed These wavy bands of light upon the surface of the landscape are not beheld at every eclipse, but likely will be seen and should be watched for in the coming eclipse During the 1930 eclipse I undertook to photograph this peculiar phenomena An account of this may be found in the June, 1930 issue of the AMERICAN CINEMATOGRAPHER These bands are about a foot apart and are approximately three inches wide They travel over the landscape about as fast as a man can run An excellent way to observe them is to spread a sheet on the ground and watch them on it

A minute before the totality the sky is often deep purple, and there is a fast fading of light It is as if some unseen power were turning off the light of the world with great suddenness When the last tract of the sun has disappeared and the moon's shadow has engulfed the spectator, the second contact, or total eclipse base, has arrived The smoked glass can be dispensed with at this time There is often a drop of temperature, sometimes accompanied by a fall of dew, strange breezes spring up, flowers close, birds go to rest, animals in the fields grow restless and often dogs start howling

Looking at the eclipsed sun, the air seems to quiver, first

Fig 3. Spectrum of flash at 2ed aed 3rd contacts and spectrum of Corona.

and second magnitude stars make their appearance During the coming eclipse Jupiter will be seen near the sun, Mercury will be a bit further away and between them will be Leonis Surrounding the dark globe of the moon will be seen the streamers of the sun's corona, a mysterious, pearly light which is little understood The corona is seen only during a total eclipse Some of these streamers are 2,000,000 miles in length Figure 1 shows a beautiful example of the corona during the total eclipse of June 8, 1918 Figure 4 is a photograph of a sunspot ejecting incandescent matter As sun spots are prevalent along the equator of the sun and as the corona is more extensive in the equatorial plane of the sun there is reason to believe that they have a bearing upon each other Against the dark edge of the moon deep, red spots of light resembling flames can be seen with a good field glass These are 'prominences", gigantic eruptions of hydrogen, calcium and helium gases Practically every element found on the earth has been found in the sun and other hot stars before it was known on the earth How this was done and how so many other facts are known about the sun is largely due to a remarkable instrument—the spectroscope This is an instrument for analysing light whose revelations are very important Light is broken up into its component colors by passing it through a form of prism Thus light from any substance that has been made incandescent can be separated and observed It was by this method that helium was first discovered on the sun, long before it was discovered on the earth. Whether it is a glowing substance in the laboratory or on a remote star—it is all the

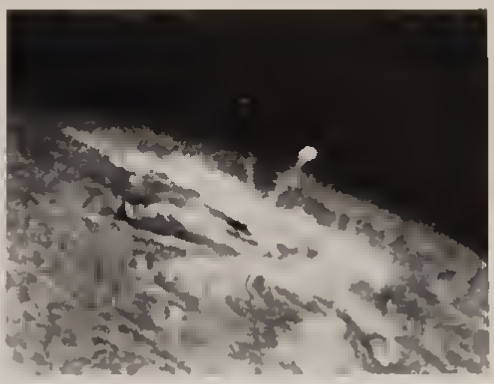

Fig 4 Sunspot hurling incandescent matter outward.

same to the spectroscopic camera Figure 3 is the picture of the spectrum made during an eclipse and shows the components of the prominences appearing as images of the sun as made through the spectroscopic camera

The spectroscopic camera is not trained on the sun, it being too bulky and delicate to accurately follow the sun's movements So it is trained on a heliostat, or coelostat, which are instruments consisting of mirrors mounted on an axis and driven by clockwork, by which a sunbeam is made stationary, being steadily reflected to one spot These instruments are also used for the regular photographic cameras where long focus lenses are used Photography plays a most important part in present day astronomy. Scarcely any visual study is done Instead, photographs are made and the prints studied Also by different exposure lengths much detail is shown that helps determine the distance and other facts concerning the stars and eclipses

For "still" pictures, the best results photographically will be secured by using slow, fine grained plates—and they should be specially "backed" to prevent halation In making motion pictures perhaps the following notes may be of help First,

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Fig. 5. Spectroscope camera in foreground Heliostat at left ceeter.

Camera Movement

by **DR. L. M. DIETERICH, A.S.C.**
Consulting Engineer

CAMERA movement can be divided into several classes of application now in practice

1 —Angular movement with fixed tripod position, so-called "Panning" and "dipping"

2 —Movement of tripod subdivided into (a) —Two dimensional movement by rolling platform or vehicle (perambulator, automobile, boat, etc), resulting in so-called perambulator, truck or follow-focus shots, with or without panning or tilting or focus change by camera manipulation (b) —Three-dimensional movement by crane, airplane, etc , with or without movement of camera relative to its support

Any one of these various camera movements of which panning and tilting is an old established practice, is always for the purpose of either following with the lens axis a moving object or person of a more or less rapid change of picture field in a scene, of producing a special photographic effect (as a detail sometimes in trick photography), or as a means of enhancing dramatic value of a scene or action

This short analysis shows camera movement to offer a great variety of possible applications and results, and to be a valuable tool for the director, cameraman and even the story constructor—if used intelligently It is, however, with the exception of the panning and tilting, a comparatively new tool, and at present is often unwisely used without foreseeing and realizing the physio-psychological effect of its results upon the spectator.

Whatever the temptation may be to produce a novelty or unusual effect, which in itself is always a valuable screen asset, one fundamental condition must always be kept in mind, which is best expressed by a query.

Is the screen effect of any camera movement pleasant to the sight of the spectator?

It is, if the underlying principle for the production of motion pictures, i e , the closest possible imitation of natural sight, is not grossly violated

One of the most pernicious violations of this principle is the blurring of the picture One kind of blurring, resulting from out of focus conditions, is, unfortunately, often unavoidably caused by the characteristics of modern lens construction, and it is a constant problem for the cameraman to keep within its permissible limitations A similar ever-existing problem for the cameraman is the avoidance of cross motion blurring with a fixed camera position

The fact that every good cameraman tries to avoid such blurring effects is the result of his knowledge that the spectator is not pleased with such effects, and that they reduce the screen value of a picture These facts should be well kept in mind when camera movement is contemplated The director, especially, who is the decisive factor in its use, must not forget when he visualizes the effect of such camera movement that he sees the set or scene as a whole with the whole expansion of natural vision, that he does not produce a blurring effect on the retina of his eye when it roams from one point to another, and that his sight is not boarded by a small picture frame

Even when trying to check the effect of camera movement by looking through the finder during such movement, the finder does not show him the ultimate effect, because the blurring effect of the colored picture is not the same on the small ground glass as the black and white picture produces on the large screen What may be acceptable on the ground glass is often disagreeably disturbing on the screen In so many technical problems a wholly satisfactory result cannot be obtained where interfering conditions prevail, and a compromise must be struck It is the same with camera movements

The dramatic effect of transporting the spectator by photographic illusion more or less rapidly from one position to another, either in the location or in the time scale, may be of the greatest value and produce upon the spectator a profound impression if—it is not destroyed by the unnatural and jarring effect of rapid focus change and cross motion with the unavoidable and so unpleasant picture blurring

The director can certainly increase tempo and action by well calculated camera movement, but must not lose sight of the increased burden he puts upon the shoulders of the cameraman who is mostly responsible for composition and mood which become so much more difficult of control with a travelling camera and fixed lighting The cameraman knows and the director ought to know the limitations of the tools at the command of the cameraman, and the director should not demand from the cameraman results which it is impossible for him to give It is better for him to curb his artistic desires than have them destroyed by actual screen results. Especially in camera movement application, the ever-existing necessity of close and whole-hearted cooperation of director and cameraman is of prime importance

Whatever the effective use of camera movement may be, the cameraman must not fail to execute such movement in a uniform and undirectional speed and under conditions, permissible for dramatic desires, so control such speed that persistence of vision produces the effect of motion without excessive image blurring, or he should use such ultra-speed of camera movement as to create streak blurring by which picture details are entirely destroyed Such rapid movement does not produce disagreeable blurring, but on the contrary, produces the effect of rapid transportation from one scene to another in a more dramatic manner than standard cutting, especially when mechanical (not chemical) lap-dissolves are employed for the few frames necessary for such movement effect

It may be mentioned here that there is a competition of practical value for camera movement in the use of the so-called "zoom" lens, which produces the same effect with stationary tripod as a platform moving in the direction of the lens axis The advantage of the "zoom" lens lies in the fact that it permits a quicker and smoother change of focal distance Its development so far restricts it to small working apertures which however renders a greater depth of focus, producing zoom effects superior to fast lens camera movement effects It must be realized that it covers only distance changes covered by a change of focal value of about one to three, as possible with zoom lenses so far offered in the open market.

The cameraman must also realize that an increase of focal distance decreases the momentary depth of focus or that a greater depth of the field is covered by such lens without out-of-focus disturbance when the lens performance is in short focus position than when it approaches and assumes long focus position and efficiency

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Exposure-Meters in Professional Cinematography

by **WILLIAM STULL, A.S.C.**

EXPOSURE-METERS, in one form or another, have for years been accepted as vital adjuncts to many phases of photography, both professional and amateur. They are frequently used, for instance, by photo-engravers and makers of color-separation negatives, while their use by experienced amateurs is too well-known to need elaboration. In so far as professional cinematography is concerned, however, such devices have seldom been used. This is regrettable, for in all photography there are few workers who face such unusual and exacting problems as do cinematographers. In cinematography, the need for absolute uniformity is far greater than in any other field while the means of control after the exposure are far less than in any other process. Everything must be in the original negative; very little control is possible in either the development of the negative or the printing of the positive. Furthermore, a motion picture is composed of several hundred scenes, each of which is not merely an individual unit, but necessarily a part of a homogeneous whole. Scenes shot one day may be intercut with others made days or weeks earlier or later—and they must match each other perfectly in tone and contrast. Some means of mechanically measuring the intensity of the light reflected by the subject would, in many instances, prove of considerable value in obtaining this uniformity.

The recent introduction of several new exposure-meters based upon variations of the photoelectric cell, however, has given the entire question a renewed interest. Several of these devices have been put into use by various studios and individuals. In view of this, the writer recently undertook a somewhat detailed survey of the practical utility of these devices, checking the reading given by the meter on a number of different sets in several studios with the exposure actually being used. As the accompanying table shows, the meter proved its accuracy completely, but naturally failed to make allowance for the modified exposure used in making special night-effect scenes. Notwithstanding this, however, the accuracy of the device proved to be very close to 100 per cent. the average reading of the meter being f 2.48 while the average exposure actually being used on the same sets was f 2.56.

In making this survey, the writer naturally sought the opinions of a number of representative cinematographers; as was to be expected, these opinions varied considerably. In the main, these men admitted the theoretical utility of such an accessory, but doubted its practical utility for normal production conditions. Perhaps the best summary of the matter was voiced by Jackson Rose, A.S.C., who said, "Personally, I've never used such a device—principally because no exposure-meter as simple and accurate as these new photoelectric meters previously existed. More than once, though, I've wished for something of the sort. Under normal working conditions on the studio stages, where the cinematographer has complete control of his light, and is working with absolutely known factors, such an aid is unnecessary; but let him work under unfamiliar conditions—such as a distant location, where altitude and atmospheric conditions are unfamiliar or under familiar conditions with some unfamiliar factor—such as special filters or a new type of film—and the meter can easily be worth its weight in gold. An excellent example is furnished by one of my closest friends: he is a technician of long years of experience, and recognized as one of the two greatest experts on filters and filtering in the industry. Whenever I find myself at a loss on the use of filters, I seek his advice, frequently we go out together and make practical tests to solve the problem. In preparing for a recent production we did so, as I wanted certain special filter-effects with which I was not familiar. When we made the tests, I computed the exposure mentally, basing my conclusions on my past experience with Super-Sensitive film and other filters, and using the published filter-factor of the special filter we were using. He, on the other hand, consulted an exposure-meter, and then did a little figuring on paper. The results showed that his figure was the most accurate, and he had taken only a few seconds longer to reach it than had I mine. I was, naturally, surprised to see him using a meter (it was an antiquated "Watkins" meter for still cameras), he confided to me that he regarded the use of that old meter as the secret of his success in using filters of all kinds under all conditions.

Now, with these more modern photoelectric meters, the obtaining of such a reading would have been vastly quicker and simpler, for all that would have been necessary would have been to slip the filter over the meter, and read the exposure directly off the dial.

"Naturally, such meters would prove invaluable for any cinematographer working under unfamiliar conditions. The only stumbling-block that I can see is the personal pride of the cinematographer. Most first cinematographers are men who have spent a vast deal of time and money in learning their business—reducing it to a matter of instinct; naturally, they hesitate to admit that they need any aid at all under any conditions—no matter how unusual. I don't blame them, but I personally feel that if any such device is going to increase my efficiency, I'm certainly going to take advantage of it. And after all, no mechanical device can possibly be made to do the real work of the cinematographer—picking artistic compositions and arranging artistic lightings."

Charles Glouner, the head of the Camera Department of the Universal Studio said much the same, adding: "To my mind, the greatest value of such meters will be not in the studio, but on location. For when a company goes on location—particularly when the location is distant from the studio—there is always a chance of being more or less deceived by unfamiliar light-values. And when a unit is several days' journey away from the studio, the cinematographer can't afford to make mistakes, too, he hasn't the opportunity to see his rushes each night as a check on what he's getting. Therefore such a meter would be invaluable in starting a company off on its first few days' work on location. The great thing, of course, is to be willing to accept the aid of such a meter—to realize that it will not lessen the respect in which the cinematographer is held. After all, no one condemns a laboratory man for determining the printing-light of a negative photometrically rather than by inspection of the negative, or an engineer for using a slide-rule rather than figuring each item out on paper. Similarly, in these days when efficiency means so much, the cinematographer who knows how to take advantage of every scientific aid available and blend it with his own artistic ability is far and away the best man for the job."

Oliver Marsh, A S C pointed out that 'An exposure-meter such as this one can—properly used—be a great help, but the user must realize that it gives only an overall reading it doesn't help him if he has fallen down on the balancing of his light It will tell me, for instance, if I've got enough light on the set to make an exposure possible—but it won't tell me if I have too strong a backlight, or if I have too weak a front-light in the shadows Of course, it is quite possible to take a reading for each component separately but that takes time—and a cinematographer's experience can—or should—tell him that in an instant On such special occasions as my last picture, 'Rain,' which was made, both exteriors and interiors, on location, such a meter would have proven invaluable for matching the natural light of the exteriors seen through the windows of the sets upon which I was making the interior scenes by artificial light. I tried to get such a meter then, but none was available at the moment—and all those in the studios were in actual use It would have helped me a great deal had I been able to have one, so that by first taking a reading of the light-values of the exterior portion of the scene, and then closing the windows and taking a reading of the value of the artificial lighting inside, I could have matched things perfectly As it was, I had to draw upon my experience. it happened that I hit it perfectly—but I might just as easily have missed it a trifle An accurate meter would have made assurance doubly sure, and could have easily saved the company a great deal of money for retakes, which would have been imperative had my unaided judgment been at fault "

To Arthur Miller, A.S.C, the greatest possibilities of these meters lie in matching the foreground and background values in photographing projected-background process scenes Said he, "The most deceptive factor that I have yet encountered is the disparity between the visual and photographic values in process scenes If such a meter will give an accurate measure, first of the photographic value of the projected background transparency, and then of the lighting on the actual foreground action, it will simplify the making of these important scenes immensely "

Farciot Edouart, the head of the Transparency Process Department of the Paramount Studio corroborated this "In either projection-transparency or complementary-color-transparency work such a meter can easily be invaluable," he said "In the latter process particularly, the red light used to illuminate the foreground action is highly deceptive, for the average cinematographer has had no reason to train his eye to judge the photographic value of colored light Even the trained transparency technician would find such a meter valuable—provided it would read accurately for this red light.

"Several years ago, in fact, I built a special photometer to use in this work But it was of the ordinary type, which depends upon the visual matching of the light reflected by the subject with a known light Therein lay its weakness—and the strength of these modern photoelectric meters For the human eye is most unreliable it has too great powers of accommodation, and reacts differently according to the amount of fatigue I have made as many as six separate readings with the conventional comparison-type of photometer on a single set—and gotten almost as many different exposure-values I have made one reading on a set just before going to lunch, after a morning's work, and then another after lunch—without moving a single light—and found the two widely divergent It was the fault, not of the meter, but of my eye The photo-electric cell meter, however, is, if accurately made, a real precision instrument, and completely eliminates the human element In the making of process shots it can be extremely useful, for in certain shots of this nature I have made parts of the shot at intervals separated by many weeks—and had to match the lighting of the two to an extremely precise degree Now, in so far as I am personally concerned, that is not too difficult, for I have trained my eye and memory through many years of specialization in process work to the point where I can absolutely guarantee to match the lighting in process scenes made months or even years apart nevertheless, any such instrument as this, which tends to minimize the possible error of the human element is a distinct aid to efficiency, and a personal aid to the individual '

At the same studio, Charles Lang, A S C, introduced two other important considerations "To be truly accurate," he remarked, "the readings of such a meter should be made not merely from the approximate viewpoint of the camera, but through the actual lens used in making the shot. Otherwise, you have no means of checking the angle covered by the meter, nor any proof that the meter is not being directly hit by some individual unit in the back-lighting equipment, which, though properly screened from the lens of the camera, may not be so screened from the eye of the meter Such a meter, too, would be invaluable in instances where the voltage on a set was not constant—as when the set was on the end of a circuit feeding several other stages, and accordingly subject to fluctuations when the companies on the other sets were or were not working The changes in the color-temperature of incandescent light caused by lowered voltage are not always easily detectable by the naked eye, but can wreak great havoc in the results achieved on the film."

President John Arnold of the A S C, head of the Metro-Goldwyn-Mayer Camera Department summed the matter up excellently when he said, "The accuracy and utility of such devices are unquestionable, the point that must be always remembered, however, is that they must only supplement the human element Even the best meter can only give an overall reading it cannot determine the artistic balance of the lighting It can aid the experienced cinematographer, but it cannot take the place of his experience It will not enable John Doe to take charge of a set and photograph Norma Shearer as artistically as does William Daniels, A S C, or any trained camera-artist It will enable John Doe to know that he can make a technically satisfactory exposure—but it cannot give him the artistically balanced light that makes the difference between good photography and bad On the other hand, it can and will ensure that a trained cinematographer may have an unerring, mechanical staff to lean upon when confronted with unfamiliar conditions As such, even though the man may be able to meet these conditions satisfactorily, the meter would serve both as a check and as an inspirer of confidence "

COMPARATIVE TEST OF PHOTOELECTRIC EXPOSURE METER

STUDIO	SET	CAMERAMAN	METER READING	ACTUAL EXPOSURE	NATURE OF SCENE
Universal	1	Arthur Miller	f 2 8	f 2 7	Normal
Universal	2	Geo Robinson	f 2 5	f 2 7	Vaudeville Act
M-G-M	1	Oliver Marsh	f 2	f 2 8	Night Exterior
M-G-M	2	Oliver Marsh	f 2	f 2 8	Night Exterior—Fog
M-G-M	3	Hal Wenstrom	f 2 7	f 2 7	High-key Interior
Paramount	1	Harry Fischbeck	f 2 3	f 2 3	High-key Interior
Paramount	2	George Folsey	f 2 7	f 2 8	High-key Interior
Paramount	3	Ernest Haller	f 2 4	f 2 3	Low key Interior
Paramount	4	Farciot Edouart, David Abel	f 2 4	f 2 3	Night Interior for process shot
Paramount	5	Farciot Edouart, David Abel	f 2 8	f 2 3	Same Reading made on opposite side of camera booth from No 4

NOTE Lighting in all cases by Incandescent light

Motion Picture Film

In the Making

This is the second and concluding installment of this unusually interesting story of the making of motion picture film, prepared by the Eastman Kodak Company.—The Editor

//THE poor benighted 'indu ' of whom it is reported in the familiar Limerick that "for clothes 'e makes 'is skin do' doesn't prove a very good customer for the Messrs Hart, Schaffner & Marx. Yet his wife wears silver jewelry If nothing else, Brother Indian is silver-conscious

The cinema world has better reason than the East Indian to be silver-conscious No change of policy nor any legislative decision can devalorize silver as the one material without which there would be no motion picture industry and the absence of which would make it useless to employ thousands of persons and an enormously impressive array of machines in the manufacture of film

The typical film manufacturing plant, with the workings of which the AMERICAN CINEMATOGRAPHER acquainted readers in July, receives daily a shipment of silver that is large in comparison with the requirements of any other industry or even of the Mint More than four tons a week, in the form of ingots, pass through the storage safe

The thought of using such a large quantity of silver for manufacturing is spectacular The actual operations of turning silver into silver nitrate for use in photographic emulsions are less spectacular, but they should be interesting to any projectionist with a desire to know something of how film is made In silver nitrate manufacture a glimpse is obtainable of the extreme methods necessarily utilized in the photographic industry to make the delicate product meet specifications every time, everywhere

Into every bar of silver bullion received in this photographic plant a hole is drilled, a record number is punched Chips from the drillings are promptly tested by the department handling the silver, in addition to an entirely independent test by a laboratory charged with responsibility for the quality of all raw materials Impurities are rarely found in the silver, for the supply is bought with extreme purity as its object

Even though impurities are seldom present, the inspection continues year after year If a trace of copper or iron were permitted, unchecked, to go into the manufacturing stream endangering photographic effectiveness, later tests would discover and eliminate the result but time and other materials would have been wasted in the meanwhile Production schedules would have been interrupted Not only silver, therefore, but every ingredient, as well as every finished product and as well as products in the process of manufacture, is tested by the typical film manufactory that we are observing Of the thousands of employees at the plant, hundreds devote their whole time to the careful inspection of materials at every stage of evolution into finished photographic products

Observing the first step in converting bar silver into photosensitive materials, we shall instinctively feel that we are witnessing wanton destruction With our realization of the traditional worth of silver, it is difficult to avoid a shock at seeing the bars of metal dissolved in nitric acid until all is fluid and nothing solid remains

The nitric acid, it is worthy of parenthetical note, is made right in the plant under scientific conditions leading to purity of grade Nothing can be left to chance in the manufacture of film

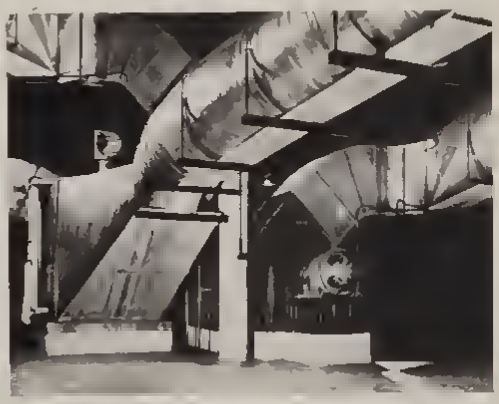
The silver nitrate solution we have then seen made is siphoned from its porcelain bowls into troughs, whence it runs through glass tubing to an evaporating room on the floor below There, men wearing rubber aprons and rubber gloves guide the flow into other bowls, which are set on heated tables The heat drives off water from the solution, and, when the concentrated solution cools, the silver nitrate crystallizes Silver nitrate in this form would be more than suitable for most uses—but photographic manufacture is an exacting master

Consequently, the crystals are once again dissolved in distilled water and once more crystallized This operation is repeated many times—until all impurities are removed Final evaporation leaves snow-white crystals, appearing like soap flakes but more vitreous and brittle Then come careful drying processes

Silver nitrate is sensitive to light, It gradually loses its whiteness under the influence of the sun's rays It was this basic chemical fact that made photography—and the motion

(Continued on Page 34)

Purifying silver nitrate by evaporation and recrystallizing



Ducts for the conditioned air that dries the film

HAL HALL

says

Credits

FOR some unknown reason, someone at Universal Studios suddenly decided recently to eliminate the names of the cameramen from the credit list on the credit title of all pictures produced by Universal Pictures

When I heard this I could not believe it, for throughout the years "Uncle Carl" Laemmle has always seemed the very personification of fairness Like all producers, he has made his mistakes, but—he has never made the mistake of being unfair, especially with the technical men However, it was true Credits for cameramen had been forbidden under the silly and absurd pretext of "saving money"

Imagine! Refusing to place upon the credit title the names of the men whose photographic art make possible the placing of the picture on the film After all, what is a motion picture? It is not a collection of sets actors, a story, director and a flock of supervisors All these with all their work, no matter how good it might be, would never be seen if they and their work was not photographed and placed upon a little strip of celluloid by a man who has spent years in the development of the art of so doing

Imagine! A bright executive lays out a budget calling for the expenditure of, say, $275,000 00, for the making of a picture The fate of more than a quarter of a million dollars is placed in the hands of one cameraman, who, if he fails, will ruin the picture And then— they do not want to give him a single line of screen credit on a title sheet that is cluttered up with the Lord knows how many minor individuals who would not be missed if they dropped through a hole in the earth

Surely, I thought, "Uncle Carl" must have suffered a brainstorm when he entered that hospital back in the east just before the order was issued For, as I said before, "Uncle Carl," has always been so fair.

Well, I don't know just what happened, but screen credit has been returned to the cameramen at Universal Perhaps "Uncle Carl" didn't know anything about what was happening It would seem so, for now that he is again on his feet the cameramen are getting the credit that is due them May such an absurd mistake never happen again! Although, there have been whisperings to the effect that other studios had planned to follow in the footsteps of Universal

In the humble opinion of this writer, no man in the studio deserves more credit than the cameraman

◆

The Amateur Contest

ONLY three more months remain in which to make that picture and enter it in the $1000 00 Amateur Movie Making Contest which this magazine is conducting This will be almost the last warning, for time is flying rapidly, and all films must be in the mail or express by midnight of October 31, 1932, to be eligible for the prizes Films are arriving from all over the world—a six-reeler from France arrived today So if you have confidence in your picture making ability, better start right now and get busy. The prizes are big and the recognition should be worth even more than the prizes.

Suggestive Advertising

THIS writer almost missed seeing an excellent motion picture recently because of the type of advertising used to announce it to the public From the words and artist's drawing in vivid colors, used in the announcement of the picture, this writer was certain that the picture must be a salacious mess, designed to tickle the fancy of sex-mad morons. So, he didn't go to see it when it played in one of the big houses of Hollywood Then he heard that it was a clean and delightful comedy, so picked it up at a neighborhood house and found it one of the best pictures of the year.

If this writer would stay away from the theatre because of the advertising, there must have been countless others who felt the same way about it Why, in Heaven's name, do the powers that handle the advertising of pictures think that they have to make the people believe that they are dirty and filthy? That may drag in a few people who like to wallow in the mire and filth, but it will turn the better type away It is time that the Hays organization did something really effective in changing such practices Other big industries turn out advertisements that bring results without having to resort to things of this sort. Surely, the brilliant minds in the picture business should be able to do likewise. The great American public is not filth-minded, so why do picture producers and exhibitors think that they should feed them that type of advertising? Some day this writer hopes to see a full page advertisement in the newspapers headed something like this— "If You Want to See the Cleanest and Sweetest and most Entertaining Picture in Years, Go to the etc., " Why not, if the picture is that? I bet that the theatre would be packed

◆

Captain Henry Lomb

MOST of us who use cameras and projectors and microscopes little realize that one of the men who helped found one of the greatest institutions in the field of optical science, found his greatest delight in giving service to the city in which he at first struggled and later reached the heights of success I speak of the late Captain Henry Lomb, who was one of the founders of the firm of Bausch and Lomb

Recently, more than forty thousand residents of the city of Rochester, N Y, gathered for the unveiling of a shaft of black Minnesota granite, a striking and lasting memorial to Captain Lomb, who is known to the people of Rochester not so much for his work in the optical field, as for his virtues of day by day solicitude for the well-being of his fellow citizens, for his patient striving to bring to his city a constantly enlarging horizon of public opportunity for health, education and self-improvement As the mayor of Rochester said in his speech accepting the monument, "Rochester is a finer city and a better place to live because of Captain Henry Lomb"

Let us hope that more business men will follow his example.

◆

Remember

A SMILE will get you further than a frown A kind word will make the other fellow happier A good deed will make you happier. Maybe if we all practice just that we might help bust the depression We can't succeed if we admit we are defeated

Concerning Cinematography

Critical Comments on Current Pictures
by **WILLIAM STULL, A. S. C.**

TOM BROWN OF CULVER

◆ This picture is certain to stand for a long time as a black mark against the good name of the Universal Pictures Corporation, and its revered head, Carl Laemmle, for it bears no mention of the cameraman on its credit-titles. This is doubly amazing coming from the beloved "Uncle Carl," who, through his long years in the motion picture business has built himself an enviable reputation as a man who deals honorably with his employees. No one is in a better position to realize how greatly the cinematographer contributes to the success of a production than is Carl Laemmle, in whose studio innumerable pictures have been saved from incompetent direction by the sheer ability of the cinematographers. For, a good cinematographer is not merely a man who contributes attractive photography to a picture, but one who, through long experience in the picture business, is able to protect the director from falling into the pitfalls lurking to ensnare the incompetent and careless. And Universal's cameramen are very good, for Universal has, in times past, employed at least as many incompetent directors as any other major studio.

"Brown of Culver" is an excellent illustration of the case in point. The story itself is good, as is the acting, and the direction of the individual scenes. But somewhere along the line—perhaps in the adaptation, the direction, or the editing—someone has slipped up, with the result that the completed picture is episodic, with undoubtedly the worst continuity seen in months. Wherever possible, the cinematographer has attempted to bridge the yawning gaps photographically; but he could not do everything all of the time.

Viewed strictly as photography, "Brown of Culver" is an excellent job, displaying good taste throughout, and avoiding all of the pitfalls lurking in the subject-matter. Made in Indiana in the springtime, with backgrounds that demanded filtering and with the players clad in costumes that could not be filtered heavily, the cinematographer had a difficult problem, which he solved perfectly. In his treatment of the many military ceremonies, he has avoided the obvious treatment without rushing to the opposite extreme of artiness. Therefore, I am doubly proud to give to Charles Stumar, A.S.C., the richly-deserved credit which Carl Laemmle denied him. Let us hope that Mr. Laemmle will see the picture again, meditate not alone on the excellent photography and the wretched continuity therein, but also upon the motives of the picture. Honor, Fair Play, and Loyalty and hereafter accord credit where credit is due, dealing once more as fairly and honorably with his cameraman as he has in the past.

REBECCA OF SUNNYBROOK FARM

◆ In this picture, Glenn MacWilliams, A.S.C., once more hits his artistic stride which has, of late, faltered a bit. His treatment of the earlier sequences of this production—especially the exteriors—is well-nigh flawless. In the later sequences, however, he has somehow failed to keep Director Al Santell from committing a serious artistic faux pas. Shortly after the middle of the picture—with no change of story-mood, the photographic treatment is brutally changed from a treatment marked by idyllic simplicity, the picture suddenly changes to a treatment of sophisticated "artiness," and becomes an orgy of weird lightings and camera-angles. There can be no excuse for this, if the director did not know enough about his business to avoid this, the cameraman should have known—and kept the director straight. Another technical flaw is the fact that, in the early part of the picture, much important action occurs in running shots of the principals in moving automobiles, wagons and sleighs, these scenes were photographed normally, with indifferent results both in photography and recording, despite the fact that they could—and should—have been made by use of the transparency-projection process which would assure better results and greater simplicity in the making.

BIRD OF PARADISE

◆ This picture is not by any means art—but it is certainly box-office. The photography is credited jointly to Clyde deVinna, A.S.C., Edward Cronjager and Lucien Andriot. It would be difficult to name three men whose work is more radically different. The result is unusual, intensely spotty, with here a scene obviously deVinna, next to it one just as clearly Andriot and both cut into an all-Cronjager sequence. Under such circumstances, there can be no attempts at a sustained photographic mood, but with three such artists working on a picture there can be no question of the individual quality of the photography. "Bird of Paradise" is one of the most striking pieces of photography recently released—as gaudy as a de Mille bath tub (which in every respect it resembles)—and as sure to tickle the public fancy, despite the cinematic bad-taste.

The real honors, however, belong to Lloyd Knechtel, Vernon Walker, A.S.C., and Don Jahraus, who have contributed noteworthy special effects, as sensational as the celebrated Red Sea crossing of the memorable "Ten Commandments." The picture is almost entirely printed on tinted-base stock, to its enormous advantage. A fine musical score also serves to heighten the superficially dramatic appeal of the film.

THE FIRST YEAR

Though beautifully photographed, this production falls somewhat below Hal Mohr, A.S.C.'s, usual high standard. In addition, it indicates the degree of artistic specialization now attained by cinematographers. Hal Mohr's metier is not the simple Gaynor-Farrell type of story, his work has a sophisticated brittleness that is perfectly attuned to the stories used, for instance, by Joan and Constance Bennett, or Ann Harding, but lacking the softness and simplicity required for expressing Janet Gaynor's elusive charm. One would scarcely dream of assigning Cecil de Mille to the direction of such a story, nor should one assign Hal Mohr, the cinematographer of the sophisticates, to so unsophisticated a production.

THE MIRACLE MAN

◆ This picture is another example of true cinematographic artistry. David Abel, A.S.C., has put a deal of feeling into the photography of every scene, and has succeeded in matching the mood of the story to perfection. Farciot Edouart has contributed some unusual transparency-projection process shots—notably of Sylvia Sidney and Lloyd Hughes in a sailboat. These shots demanded unusual coordination of background, foreground-action and lighting, and so perfect are they that they cannot be distinguished from straight shots—except by their perfection. Every scene in the picture, for that matter, is noteworthy, and should be studied by everyone interested in fine cinematography.

"The Call of the Range" Charles J. Belden

"Country Bridge" Augustus Wolfman

"The Fisherman" H. M. Armstrong

The Negative-Breakdown System

by **DAVID RIDGEWAY**
Sound Department, R-K-O Studio

ONE important outgrowth of the present depression in the motion picture business is the added importance attached to detailed economies in all of the technical departments of a studio. One of the more recent of such economies effected in the R-K-O Studio is what is known as the "Negative Breakdown" system of conserving positive film used in recording. It is a well known fact that not only is a great deal more film exposed in the making of a picture than is actually used in the final picture, but a great deal more film is exposed during the various "takes" of a given scene than is finally printed up for the use of the cutters. Dramatically speaking, this is of course unavoidable, but at the same time, it represents a considerable waste of both the film itself and the time, labor and money involved in processing unsatisfactory takes.

With this in mind, the writer recently submitted to the Technical Board of the R-K-O Studio the suggestion that very considerable economies could be effected by segregating these unusable takes before the development of the sound-track rather than after, and accordingly developing only the takes that will be actually used. The technical Board, under the Chairmanship of Mr. Carl Dreher, studied the proposal, and, finding it feasible, developed it to the point where it is now in practical operation both in this and several other studios.

The negative breakdown system is essentially based upon the fact that studio sound-recording is done, not on high-speed negative emulsions, but on slower, positive, emulsions. Such emulsions do not require the extreme precautions regarding the absence of light before development that the more highly sensitized negative emulsions do. Accordingly, since it has always been the studio's custom to punch the scene and take numbers in sound-track negative immediately preceding each take, it is a simple matter to rewind the positive film under a yellow safelight, and remove the individual takes which have been satisfactory. These takes are then joined together in the usual manner, and developed and printed quite normally. Since, on the average, only about one take in four is perfectly satisfactory, a saving of approximately 75 per cent in developing cost is at once effected.

But the saving does not end here. In the double-film system now used for all studio recording, the sound and picture are, as is well known, recorded on separate films. The sound-track negative, though made upon standard 35 mm. positive film, utilizes only a small part of the sensitized area of the film. There are various objections to the use of a smaller standard of film for the sound recording, but it is entirely practical to utilize the unused portion of the present sound-track negative. This we do in the R-K-O negative breakdown system. The unused takes of scenes are, as has been explained above, segregated from the usable ones. These usable takes are developed in the normal manner, the unused ones are held until the picture of which they are a part has reached the final cut, and there is no possibility that they will be needed. They are then spliced together, and the film—which is coated, of course, with a positive emulsion—is utilized for the printing of the sound-track daily prints. The film is reversed end for end, so as to bring the previously used portion to the side opposite that upon which the daily sound-track is to be printed.

This system has worked out with complete success in the R-K-O Studio, and is applicable particularly to studios which do not have their release-printing laboratories on the west coast. In case the studio makes its own release-prints here on the coast, there are almost inevitably enough short ends of positive film left over from release-print runs to more than amply provide film for daily use.

In actual practice, naturally, there are a few details necessary to the operation of such a plan which make its operation slightly more complicated than would be suggested by this brief outline. For example, it is naturally advisable, too, to keep the reclaimed film segregated as to emulsions, so that emulsions of different manufacture, or of different numbers from the same manufacturer, are not spliced into a single roll for the printing of daily prints. These, and the various other minor technical details, however, have been satisfactorily routined by the R-K-O Technical Board, with the result that considerable savings are being effected on current productions.

Such a system is, to a certain extent, also applicable to the handling of picture negative. It would be quite possible, at least, to segregate the good and bad takes of the picture negative much as the sound negative is now segregated, and to process only the takes that will be actually used. Several factors, however, prevent commercial application of this system for the present. In the first place, scene and take numbers are not punched on the picture film, but photographed. In the second place, even were they punched, the far greater speed of modern supersensitive negative film would make the segregation of the good takes a very difficult matter, and even under the best of conditions, would involve great danger of fogging the undeveloped film. Lastly, there would be no possibility of reclaiming the undeveloped film. Therefore, the R-K-O Technical Board, although in favor of the negative breakdown system as a proved economy measure in handling sound track, has not deemed it practical for application to picture negative on current productions.

◆

RCA 16 mm. In London

WITH the Duke and Duchess of York among the thousands of visitors to the International Congress of Film Exhibitors at Grosvenor House, London, RCA Photophone, Ltd. conducted continuous demonstrations of the RCA Victor Company's new 16 mm. portable sound-on-film projector for five days. Several subjects were loaned by Walter Herman, British representative of the McKee-Heller Company in New York City. It is said the Duke of York is considering the purchase of one of the machines for installation in Princess Elizabeth's cottage.

◆

WHY NOT ONE FILM FOR ALL SHOTS?

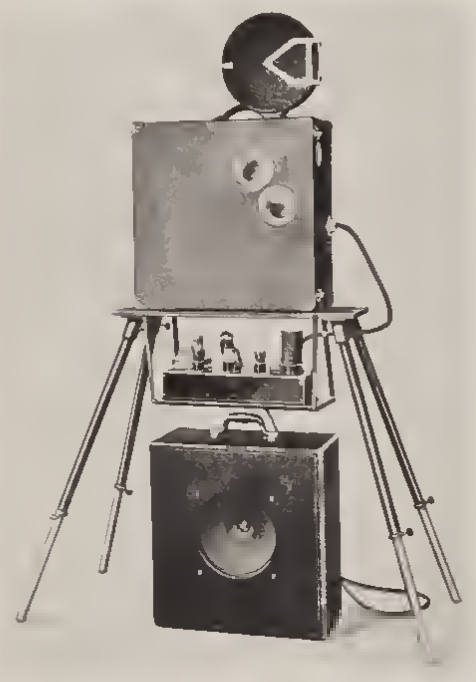
...That question concerns every producer and cameraman. The answer is easy: Use Eastman Super-sensitive Panchromatic Negative *with gray backing*..."Inkies"...arcs...daylight...any kind of light is right for this versatile film. Cameramen are rapidly finding that out, and everybody from actor to exhibitor is benefiting from the use of this remarkable all-purpose negative. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

EASTMAN **SUPER-SENSITIVE PANCHROMATIC NEGATIVE** (GRAY-BACKED)

..In the Realm of Sound..

New Synchrofilm Portable Sound Projector

THE Weber Machine Company of Rochester has just announced a new 35 mm portable sound projector that should be of considerable interest to anyone desiring an equipment that is really portable and also dependable It is called the Synchrofilm Projector, and has been designed for simplicity in set-up, operation and transportation



The new Synchrofilm sound projector

Some of the outstanding features of the new projector follow The carrying case is of suitcase type and is made of cast aluminum The projector complete weighs but 60 pounds, lightness being afforded because of the frame being made of aluminum Mazda 500 watt light furnished with standard equipment Pro ection lens 4-inch focal length, other sizes if desired The motor is 1/20 h p , 110 volt, 60 cycle, constant speed A two point rear shutter is designed as a partial fan to ventilate gate and aperture plate There is also a fan attached to the motor shaft to furnish air to cool projection lamp It is also claimed that this machine has fewer parts than any projector yet developed The amplifier is a push pull Pentode type and the speaker is dynamic cone type

RCA for Advertising Agency

LORD & Thomas, prominent advertising agency which is said to place the largest volume of radio advertising on the air, has purchased special phonograph disc recording and reproducing apparatus from the Record & Recording Division of the RCA Victor Company.

It is understood that Lord & Thomas plans to make disc records of the Lucky Strike programs with the new apparatus, as an inexpensive means of preserving the programs exactly as they go out out on the air This permanent file of programs is expected to prove especially valuable to the advertising agency and the client because it permits of frequent rehearings whenever it is desired to analyze a program or study the microphone technique of the artists appearing on the program

The recording apparatus is simple, inexpensive and portable It consists of a unit of two turn-tables, an amplifier and suitable volume control, a two-button studio microphone and a loudspeaker for playing back the records after they have been made. The records may be made by simply placing the microphone before the loudspeaker of an ordinary radio receiving set Since the turn-tables revolve at a speed of 33⅓ revolutions per minute it is possible to place up to about 15 minutes of recording on one side of a 12 inch record When the recording on one disc nears the end, the other turn-table automatically starts and takes up the thread of the recording without a break in the continuity In the meantime, the first record is turned over to prepare it for further recording, if necessary. Thus, it is possible to record an hour program with the minimum of attention

Pre-grooved records of a semi-flexible material are used for the recording, and the records may be played back immediately after they are made, and as many times thereafter as desired

◆

Iron Age Article Tells of Accuracy in Sound Printing

HOW the application of the sound track to motion picture film has necessitated extreme accuracy in the machines that produce theatre prints, is shown in a recent article in Iron Age written by C A Ziebarth, secretary and general superintendent of Bell & Howell Company

It requires no stretch of the imagination," says Mr Ziebarth, when considering the motion picture industry to understand that in the last analysis the movie theatre audience is the final judge If it was exacting in demanding quality in silent films, it is even more critical in appraising sound films, the production of which has added many new complications

'Sounds of low frequency give little trouble but when frequencies of 4000 to 5000 per second (the upper range of the piano) are encountered the time element becomes so important that extreme machine accuracy is a necessity '

The Iron Age article, which is profusely illustrated, describes in particular how the Bell & Howell Company produced for its sound printer a sprocket with teeth hobbed to limits within 0.0002 inch

Laboratory Department

Conducted by **EMERY HUSE, A. S. C.**

Principles of Sensitometry and Their Practical Application

PART 16

WITH the advent of machine development for negative it was necessary to recompute the formula given in the previous section and essentially slow it down With the development of film passing through a solution at the rate of approximately 90 feet per minute considerable agitation is set up, thus increasing the rate of development of that negative With solutions of the strength of that submitted above, combined with the accelerated development in the machine, the development time would be so short as to be almost prohibitive It was, therefore, necessary to alter the strength and in some instances change the balance of the chemicals in the solution A typical revised picture negative formula for use in a developing machine operating at speeds approximating 90 feet per minute is given here

Borax Developer (Machine)

Elon	0 6 grams
Sodium Sulphite	90.0 "
Hydroquinone	1 9 "
Borax	0 6 "
Water to	1.0 liters

It must be borne in mind that this formula is only a typical one Different machines and different laboratories might require modifications of this The important point to make, however, is that almost all of the formulas in use for the development of picture negative today are of the four constituent borax type

From the standpoint of picture positive there is no single formula which fulfills all individual requirements

There are such things to consider as time of development, contrast, color of the image, and even personal likes and dislikes The formula submitted here represents a typical picture positive formula in use in motion picture production at the present time This again is for machine development under conditions similar to those for picture negative.

Picture Positive Developer (Machine)

Elon	0 5 grams
Sodium Sulphite	20 0 "
Hydroquinone	2 4 "
Carbonate	12 5 "
Potassium Metabisulphite	0 7 "
Potassium Bromide	0 5 "
Water to	1 0 liters

In a formula such as this there is considerable tolerance in obtaining the desired contrast.

In the development of sound track negative we have several problems to consider For the normal variable density track as exposed in a light valve recorder the type of developer used is very similar to the borax formula, although somewhat weakened Very often either citric or borax acid is added to this borax formula to still further hold back the rate of development It must be borne in mind that sound track negative is almost universally made on a positive type film having relatively high contrast This is done because of the fine grain and high resolving power obtainable with this type of film The contrasts to which this type of sound recording is developed is of the same order as the picture negative and in many instances somewhat lower Working with a basically high contrast emulsion it becomes necessary, therefore, to use a weaker formula and one which does not produce high contrasts, thus the use of the modified borax type solution

In the development of the variable area track it is desirable to obtain relatively high density and contrast As a result the formula used for the development of variable area negative are of the positive developer type In many instances the same positive solution can be used that is employed for picture positive Some laboratories, however, compound a formula which is more vigorous in its density and contrast building characteristics than the regular positive type

For such sound track as is made on positive film with glow lamps of one sort or another it is usually the case that a positive type of developer is used This is necessary because of the fact that the exposure with the glow lamp is usually quite weak and falls upon the toe portion of the sensitometric curve

Up to this point we have discussed in a more or less general way the practical aspects of developers and their use in the production of sound and picture negative and picture positive We must not forget that the purpose of these articles is to deal with the sensitometric relationship It is the purpose of sensitometry in the practical field to guide and control the degree of development which is desired in each case All developers are given careful sensitometric study and the development of any production work, whether positive or negative, is controlled by the use of sensitometic exposure. It is necessary to know the degree of contrast, or gamma, to which each type of film is developed

Once the developers are established in a laboratory one of the first procedures, from the standpoint of sensitometric practice, is to develop in these solutions, under their standard operating conditions, sensitometric strips so that some idea may be arrived at as to the developing strength of the solution This general procedure of sensitometric control of production work will be dealt with later but at this point emphasis is going to be given to the more theoretical side of the work in order that a complete understanding may be had of the procedure of arriving at the sensitometric constants desired It is necessary to assume, therefore, that sensitometric strips are available, having been properly exposed and developed

Having exposed and developed sensitometric strips in our possession, the next step in our sensitometric routine is to determine the amount of silver in each of the exposed and developed areas It is not the actual amount of silver in terms of ounces that we are interested in, but it is the light stopping power of each of the various areas In other words, it is necessary to arrive at the transmission or density of the various deposits With present day instruments it is quite easy to determine the light stopping power of photographic densities This is accomplished with the aid of photometric instruments which are referred to in sensitometric parlance as "densitometers" That this subject of densitometry may be more fully understood it may be interesting to consider briefly the evolution of those instruments used for the measuring of the density of photographic deposits

Technical Accuracy for Sets

(Continued from Page 7)

the artists in our studio art-departments, individually and collectively they are unquestionably the leading creative architects in the world today but in such instances as the examples cited, they lack the special technical knowledge of men like Mr. Goodman and my other associates, who combine ability as architects with this special engineering knowledge In the matter of marine settings, for instance, there are a thousand and one minute details which build to complete accuracy, but which, demanding an intimate knowledge of marine practice, are unknown to most architects The correct placement of handrails, the design and treatment of windows, portholes and doors, the type of hardware and electrical fittings, etc., must all be considered if the set is to appear true to life In the matter of railway car interiors or exteriors, the same is true European rolling-stock differs basically from American, but moreover, similar equipment of different countries or even different railroads in the same nation, differ greatly in detail An English third-class carriage is greatly different from a German one, an American Pullman of 1892 is entirely different in both construction, decoration and accommodation from one of today, some railroads both here and abroad use distinctive color-combinations for their trains—some even for special trains. Aircraft design is even more dependent upon fidelity to detail, and with the popular mind so definitely centred on aircraft, this detail must be preserved In a recent film, for instance, certain of the characters were represented as leaving Croydon Airport (London) in a machine belonging to the famous Imperial Airways· yet they were shown entering and taking off in a Fokker F-32—a type which does not exist outside of the United States Such an error might have been avoided by making them take the Dutch KLM line, which parallels the other, and uses smaller Fokkers (which are also in use in America)· but definitely establishing the line as a British one, and then showing a basically un-British airplane was a glaring mistake, which was noticed everywhere the film was shown Similarly, the interiors of foreign and American air-liners differ fundamentally, and naturally require specialized knowledge in design The same is also true of smaller machines

It would be obviously unfair to expect such specialized knowledge from the average art-director, whose chief interest, after all, is pictorial design It is likewise inefficient to assign the design of such specialized sets to an art director, knowing that he will find it necessary eventually to transfer the responsibility to the designers in another department who have the specialized information which he lacks The only logical proceedure, therefore, is to assign the creation of such settings to the specialists, who, like my associates, will eventually design them in any case Such a practice will not only relieve the art director of much work and worry, but will save a deal of time and money for the studio, avoid duplicated effort, and —most important of all—assure that, from the outset the set will be made to heighten the illusion of realism which is the goal of every worker and executive in the studio

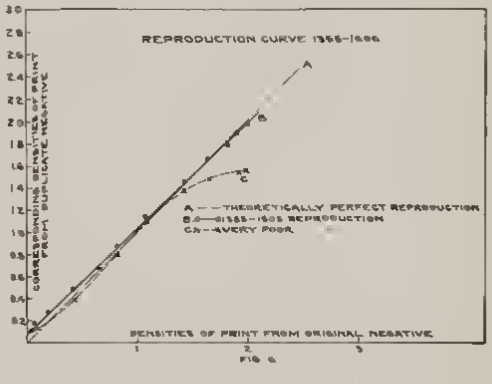
Duplication of M. P. Negative

(Continued from Page 9)

material was found which was entirely suitable in this respect Figure 4 gives the characteristics of emulsion series 1355, and it is seen from the curves that at a gamma of 1.85, it is necessary to print at a minimum density of not less than 0.40, otherwise a loss in highlight quality will occur Figure 4-a gives the development time-gamma relationship for this emulsion

A. Reproduction Curve for the 1355-1505 Process

Figure 5 shows a tone reproduction curve for the 1355-1505 process The figure is self-explanatory, in that the densities of a print from the duplicate negative are plotted against the corresponding densities of the print from the original negative The negatives and prints were perfectly matched and the prints from which the densities were taken received identical development.



Curves showing degree of perfection attained in the duplication of negatives.

It is obvious that with this method of representation, perfect tone reproduction is represented by a straight line at 45 degrees to the axes and commencing at the origin (Curve A) Curve B represents the tone reproduction with the 1355-1505 process, and it will be seen that when this curve is compared with Curve A, the process gives almost perfect tone reproduction, but only if care is taken not to print too low on the density scale when exposing the master positive and duplicate negative Curve C, Figure 5, shows what happened to the curve when these precautions were not taken, and it is seen that the curve is badly distorted

VII. THE DUPLICATION OF SOUND NEGATIVES

Frequency records with three modulation levels and frequencies varying from 100 to 6000 cycles were duplicated Listening tests indicated that the upper frequency limit for duplicate negatives was approximately 6000 cycles, which frequency was only discernible at high and medium modulation levels. Tests also showed that a slight increase in ground noise occurred which only became objectionable in the frequency range from 5000 to 6000 cycles.

Prints from duplicate negatives of piano records and vocal selections, for practical purposes, were indistinguishable from the original prints

(To be continued next month)

STYLES *from* HOLLYWOOD

BATHING SUITS

◆ At upper left is Joan Marsh, M-G-M actress, in a modern 'Catalina' bathing suit of skirtless shorts and a brassiere top strapped to the waistline back and showing popular "backless" back

◆ Charming Maureen O'Sullivan who appears in 'Tarzan of the Apes,' is seen at upper right in a two-piece bathing suit that is also very popular at Malibu where the Hollywood stars gather in summer

◆ Carrying out the idea of blondes in black and brunettes in white, we see at lower left Anita Page, M-G-M player in a black jersey suit with the approved brassiere top and skirtless shorts. Maureen O'Sullivan is shown in a one piece model of white ribbed material edged with black

◆ And at lower right, we see Miss Page again in a pose that displays the decidedly popular backless bathing suit that has captured the bathers' fancy in the picture set

Amateur Movie Making

by **WILLIAM STULL, A.S.C.**

BY ALL odds the most critical stage in the production of any motion picture is the cutting or editing. Regardless of the skill—or lack of it—evidenced in the previous stages of production, a film is made or unmade by the editing. Intelligent, imaginative editing can often save a poorly-made film, while inept editing has spoiled many an otherwise fine one. The best results, of course, will only follow a perfect combination of production and editing. For not only must the picture be well produced and well edited, but the two operations must synchronize perfectly. Even the best editor will fail if he hasn't the material to work with, and obviously, the amateur editor, less strongly fortified with experience, must receive double aid in his task of completing the amateur production, whether it be a purely personal film, or a more pretentious effort intended for club exhibition or the American Cinematographer's Contest.

Protection

People outside of the professional motion picture industry have often criticized the apparently extravagant manner in which directors photograph a great deal more footage than is actually needed for their picture. Actually, however, this is a very real economy. For if the director, while he has everything assembled for the making of the picture, does not provide ample material for the cutter, he will almost invariably be forced eventually to make the necessary added scenes—which will then prove far more costly in time, effort and money than if they had been made during the normal course of production. In a word, the director, in thus protecting the cutter, is likewise protecting himself and the company. The amateur producer has an even greater reason for securing plenty of protection-shots.

Probably the most important of such shots are closeups. The average amateur film is woefully lacking in closeups, and is thereby made much harder to cut, and extremely uninteresting to watch. Due to the small screens generally used for the exhibition of 16 mm. pictures, detailed action is seldom satisfactorily seen in long-shots; therefore closeups are vitally necessary if the film is to tell its story completely. But closeups are not by any means the only type of protection-shots that are needed. Semi-closeups, medium-shots, and those knee-length shots of two people professionally known as "two-shots" are all important. Furthermore, a plentiful variety of different angles on all scenes is a great aid in cutting, while—in amateur films especially—it is vital that all scenes be comfortably long. If a scene is too long, it can easily be cut, but if it is not long enough, no power on earth can stretch it out. In a word, begin cutting your picture with your camera; be sure that while your picture is actually in production that you cover every point, that while you are telling your story, you tell it completely. Supply the cutter (whether it be you or another) with more than enough of everything, so that he will surely have an adequate variety of scenes, angles and details to work with.

The Cutting-Room

The actual physical requirements for cutting are simple. All that is necessary is a pair of rewinds (the double type is preferable, for with them one may run the film in either direction); a splicer, and a projector. A "stripping flange" is a very useful accessory. This is virtually a single-sided reel, and may be purchased at any theatre-supply store. It is possible to make a makeshift stripping-flange out of an ordinary reel by removing one side, but 16 mm. reels are so constructed that this seriously weakens the structure, so it is really advisable to buy a regular stripping-flange, and have the hub machined out to fit the 16 mm. rewind-shafts. The stripping-flange is used for winding up lengths of film which it is not desired to keep on reels. After the film—whether it be four or four hundred feet—has been wound onto the flange, a quick turn of the crank in the opposite direction, while the film is held from turning, will remove the film easily—and there you have your film rolled up far better and easier than could be done by hand.

Another pair of useful accessories—and ones which can be made at home—are a system of racks or pigeon-roles at the rear of the cutting-table, for the storage of short rolls of film, and a large hamper, cloth-lined, into which the film may be unrolled for hasty inspection. It is a good idea to have several small hooks on the top of this hamper, upon which lengths of film may be hung by a perforation. An inspection-light set into the top of the table is also useful, while users of the negative-positive system will find a pair of synchronous rewinds (such as the British "Ensign" twin-winders) useful, as this permits them to cut negative and positive together.

The actual operations of cutting—that is, splicing—are too well known to bear repetition here, but one thing I must say—especially to entrants in our contest. look to your splices! See to it that they are firm, neat, and accurate enough to pass any projector. Several of the films already received for the contest have been carelessly spliced, causing the projector to jump or jam at each splice. This, while not perhaps a definite flaw, is naturally enough to distract the attention of the judges from the more important features of the film.

Editing

Although the mechanical operations of cutting and editing are the same, the resemblance ceases there, for the former is purely mechanical, while the latter partakes of the artistic. It is with the latter that we must chiefly concern ourselves.

The editor must first know the subject of the picture—the story that the film is to tell, whether it be a drama, a scenic film, an educational or documentary production, or a simple family record. Then, he must know intimately the material with which he is to work. He must study the film—uncut—on the screen several times before he even begins to plan. Then he should visualize in his own mind how he can bend the material given him to tell the tale that is to be told. Of course, there can be no arbitrary rule laid down to govern the cutting of all films, for each picture presents its own problems, and must be treated individually.

Once the treatment has been visualized, the actual assembly can be begun. The way this is done must, of course, depend entirely upon the way the picture has been shot. In some cases, all that will be necessary will be to cut the closer shots into their proper places, and to join the sequences together. In other cases, where the film has not been made in exact continuity, it will be necessary to break the film down into the individual scenes, segregate the related scenes and sequences, and then join them together. In such instances, it is well to prepare a written "cutting continuity"—a list of the scenes in the order in which they belong. Then, though you may have fifty or a hundred small one-scene rolls, you can easily put them in sequence in the rack of pigeon-holes behind the

(Continued on Page 44)

A Ciné-Kodak *at* $29.50

that cuts film cost nearly 2/3

Eastman announces Ciné-Kodak Eight—for Those Who Want Movie Making at the Least Possible Cost... Makes Every Foot of Film Go Four Times as Far... Saves Nearly Two-Thirds in Film Cost.

EASTMAN has developed a new film saving principle and a new home movie camera that puts it to work—the Ciné-Kodak Eight.

This ingenious camera loads with a 25-foot roll of special 16 mm. film costing $2.25. But the exposure is made so you get four images in the usual space of one. $2.25 worth of film thus gives you a full 4-minute picture on the screen.

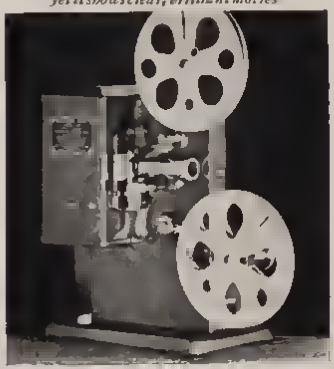
Ciné-Kodak Eight is small and light enough to carry in your pocket. It's equipped with a Kodak Anastigmat *f*.3.5 lens...a self-setting footage indicator...simplified exposure guide...full-vision, eye-level type finder combined with the carrying handle so that both elements of the finder snap into position in one movement. Price, $29.50.

Two Kodascopes Eight have been designed for showing movies made with the new camera. Kodascope Eight, Model 20, costs but $22.50 complete. Kodascope Eight, Model 60, may be had for only $75 including carrying case.

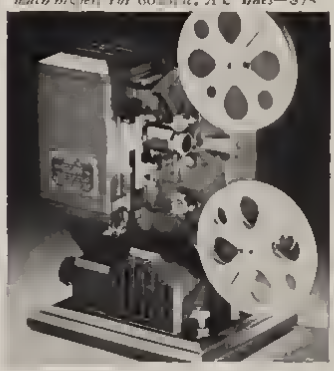
A Ciné-Kodak dealer near you will gladly tell you more about the Ciné-Kodak Eight. Examine the equipment...see the movies it makes.

YOU PAY NO TAX. The government has placed a ten per cent tax on cameras and on other articles that you use in your leisure hours. But as all outdoors invites your Ciné-Kodak, this company is not going to have anything interfere with that invitation. It is going to absorb the tax. There is no increase in the price you pay for any Eastman camera. Eastman Kodak Company, Rochester, N. Y.

Kodascope Eight, Model 20 (below), for 60-cycle, A.C. lines. This model costs only $22.50 yet it shows clear, brilliant movies



Kodascope Eight, Model 60 (below), has many refinements found only on projectors priced much higher. For 60-cycle, A.C. lines—$75



Super-Sensitive 16 for Exteriors

by **HAL MOHR, A.S.C.**

WHEN Super-Sensitive Panchromatic film was first introduced to professional cinematographers, advantage was at first taken only of its obvious superiority for interiors. Since its decidedly greater speed was of relatively little importance for exterior scenes, many cinematographers preferred to use Super-Sensitive only on interior scenes, and continued to use the regular panchromatic film, with which they were naturally more familiar, for exterior work. It is only recently that the majority of professional cinematographers have begun to become aware of the advantage of using Super-Sensitive film at all times, whether indoors or out.

Amateur cinematographers appear to be following the same course. Super-Sensitive film is, of course, of even greater importance to the amateur worker, with his more limited lighting equipment, than it is to the studio worker. On the other hand, when the amateur attempts to use Super-Sensitive out of doors, without filters, he finds that its increased speed is his undoing, for Super-Sensitive, unfiltered, is so fast that even the smallest stops provided on 16mm. cine lenses generally admit so much light as to overexpose the film. Nevertheless, from my own experience in using Super-Sensitive film in both my professional 35mm. work (I had the good fortune to photograph the first production made on this type of film) and in my personal 16mm. work, I cannot too strongly advise the use of Super-Sensitive film on all occasions.

The secret of the successful use of this type of film for exterior cinematography is an understanding of the use of color filters. Naturally, the use of a reasonably heavy filter will increase the exposure to a point where it may be conveniently controlled by the diaphragm adjustments ordinarily provided on amateur apparatus, but this is actually of only secondary importance. The real value of filtering lies in the fact that only through the use of filters can the real benefits of panchromatic film of any type be realized.

It will be remembered that the old Orthochromatic film was extremely partial to the blue rays at the expense of its sensitivity to light of any other color. In Panchromatic and Supersensitive Panchromatic films, this preference to the blue has continued, though with increasing sensitivity to the red, yellow, green and other colors. In order to lessen this preference for the blue components of a scene, various filters are used which retard the passage of the blue rays to a certain extent, and permit the weaker red, yellow, and green rays to do their work. Since the filters remove a part of the light without adding anything to take its place, the exposure must be lengthened in the exact proportion that the filter retards the blue rays. This is true of all types of film, but the exact degree in which the exposure must be lengthened depends entirely upon the speed and color-sensitivity of the film used. Clearly, if a filter which cuts out, say 50% of the blue light, is used on Ortho film which is only very slightly sensitive to the other colors, the exposure must be increased considerably to obtain a satisfactory exposure; the same filter, used with regular Panchromatic film, which is moderately sensitive to these other colors, will require a smaller increase in exposure, while the same filter used with Super-Sensitive Panchromatic film, which is not only faster overall, but highly sensitive to red, yellow and green, will in this case require only a very small increase in exposure.

This change in color-sensitivity naturally makes the same filter give different effects on different types of film. Therefore, as many professional cinematographers have found out, one may know a great deal about the effects of filters on regular Panchromatic film, and yet have a great deal to learn about the use of the same filters with Super-Sensitive film. The results, however, are eminently worth the additional trouble of learning.

The increased speed naturally decreases the added exposure necessary with any given filter. If, for instance, we have a filter which, when used with regular Panchromatic film, requires an increase of 3 times, the same filter, used with Super-Sensitive film, will require an increase of only 1½ times in the exposure. This is obviously an advantage to the owners of cameras equipped with slower lenses, with an f 3.5 lens, for instance, a 12-times filter on regular Panchromatic film increases the exposure beyond the capabilities of the lens, while the same filter, used with Super-Sensitive film, requiring an increase of only 6 times, is quite practical. The same is true of many of the extremely fast lenses, which tend to lose both depth of focus and sharpness when opened to their extreme apertures.

But this is not all. The differences in color sensitivity between the regular and Super-Sensitive Panchromatic emulsions is such that a filter will produce entirely different results when used on the two films. In the main, to produce a given result on the faster film one must use a considerably heavier filter than he would use to produce the same result on regular Pan. To produce, for instance, the correction given on regular Pan by the orange-yellow "G" filter, the user of Super-Sensitive would have to use a decidedly heavier red filter—either an "A" or an "F". On the other hand, the sensitivity of the faster film is such that the film already embodies the correction given by the 'K-2" filter, that is, Super-Sensitive film will give, without the use of any filter, the same result that ordinary Panchromatic will require a "K-2" filter to obtain.

The choice of film really therefore depends upon the sort of picture you want to produce. If you want to have a picture that is obviously filtered in appearance, use the regular film. If you want a picture which is predominantly natural, and yet embodies the desired correction (without exaggeration), use the Super-Sensitive type.

The most useful filters for Super-Sensitive film are the "G", the "23-A", the "29-F", the "B" and—if one wants to make night-effects by daylight, the "72-Gamma". The recently-introduced "X" filters, though frequently used by amateurs, are really of little use, as they were made especially for a certain still portrait-film, and are not intended for motion picture use, either professional or amateur.

The "G" filter is by far the best for all-around use where a moderate correction is desired. It requires an increase of slightly less than a stop and a half in exposure. For greater correction, the '23-A" is unexcelled, for although it is a red filter, it does not make people's faces photograph unpleasantly light, and it gives a very pleasing correction, with fine contrast, and cuts through ordinary haze like a knife. When working in unfavorably flat lights, the "F" filter is a tremendous aid, for it increases the visual contrast, and literally puts contrast into scenes where otherwise there could be none. It requires an increase of six times in exposure—approximately three stops. The "B" filter which is green, does just the reverse, and softens unpleasantly harsh contrasts. Like the "23-A", it requires an increase in exposure of a stop and a half. The "72" or 'Gamma" filter is an extremely heavy one when used to secure normal scenes with its extreme

(Continued on Page 37)

Using 16 mm. Negative Film

by **DANIEL B. CLARK, A.S.C.**

FAR too many of us who use 16mm. cameras are prone to overlook the advantages offered by negative film This is natural enough, since the reversal type of film is more widely distributed, and most of us are in these days inclined to be conservative, and reluctant to spend money experimenting with something unfamiliar as long as we can get by with the equipment or materials to which we are accustomed. Nevertheless, the negative-positive system has much to recommend it; and, in intelligent hands, will give excellent results

The outstanding advantage of the use of negative film is, of course, the fact that, just as in ordinary still photography or 35mm cinematography, the wear and tear of actual use is taken up by the positive print, leaving the negative in perfect condition for the making of fresh, undamaged duplicate prints at any time In addition, these prints may be made on any of a large variety of tinted-base positive films, allowing the use of a considerable variety of colors for special effects Furthermore, although the cost of negative-positive and reversal are approximately the same for the first print, the cost of making duplicate prints with the former is appreciably lower than that of duping reversal film, and the results more satisfactory

The outstanding difficulties connected with the use of negative film are the matter of grain, and the difficulty of finding laboratories whose work is of a quality equal to that of the many reversal-precessing plants of the Eastman and Agfa companies But both of these difficulties can be surmounted

Since the negative emulsion coated on 16mm. film is actually identical with that coated by the same manufacturers on their corresponding 35mm products — which are used for photographing many professional films, including such fine examples of photography as "Shanghai Express" and "Grand Hotel"—the film in itself cannot be said to be inherently grainy. The responsibility for the apparent increase in grain must be divided between certain factors inherent in 16mm cinematography and inept handling by the amateur cameraman

The mechanical reasons for the apparently large grain shown in many attempts with 16mm negative are inherent in the 16mm. system In the first place, the frames are far smaller than on 35mm film, and—even with the small screens commonly used in homes—the picture, and with it the images of each minute grain, is subjected to a far greater degree of enlargement than is the case with 35mm film But this is not the real seat of the trouble: in viewing a 35mm picture the audience is never very close to the screen, while in viewing a 16mm film, the audience is almost on top of it This proximity makes every detail—especially the objectionable ones — take on an unnatural prominence In viewing the average 16mm film, the audience is as a rule hardly more than five or six feet away from the screen, in viewing a 35mm film, the audience is on the average from forty to a hundred feet from the screen At this distance, normal grain is imperceptible, even on a large screen, but try sitting in the front row of a good-sized theatre: although you will still in all probability be twenty or thirty feet away from the screen, you will become painfully conscious of the grain, and the entire picture will seem like a seething mass of squirmy maggots

But, you will ask, why is it that I see the grain when I use negative, and not when I use reversal film? There are two reasons one of them has to do with the chemistry of the film, the other with the way you use the film yourself

It is axiomatic that slow emulsions have less grain than fast ones, likewise that positive emulsions have less grain than negative emulsions Now, reversal film, despite the fact that the nature of the reversal process permits it to have an effective speed identical with that of a corresponding negative emulsion, is basically a positive-type of emulsion, and therefore relatively slow By the same token, its grain is finer

So much for the inherent grain-characteristics of negative 16mm film Now—what can be done about it? The answer is—understand how it works, and use it properly! Then you will be able to produce pictures in which the grain compares favorably with that of reversal films

Anyone who has studied or read anything at all about photography knows that a film—either still or cine—consists of a celluloid base, upon which is coated an emulsion consisting of microscopic particles of silver-bromide, treated so as to be sensitive to light of different colors and held in suspension in a thin layer of gelatine Now when this film is exposed to light, the action of the light-rays effects some rather intricate chemical and physical changes upon the sensitive silver particles When the film has been developed by treatment with the proper chemicals, it will be seen that the light has turned these tiny, white particles of silver bromide into black particles of metallic silver Just how dark these particles are is determined by the strength of the light reaching them When too much light strikes them, they explode, like a kernel of popcorn, and become tremendously bigger than they would normally be This is what happens when you overexpose your film. Since these tiny particles are all so greatly over-expanded, it can be seen that they will produce correspondingly large individual images on the finer-grained positive film It is these expanded images of the "popped" silver particles of the negative emulsion which show up on the screen as grain, and look like little worms crawling over the screen.

But since the silver particles only explode this way when exposed to too much light—that is, when the picture is overexposed—the obvious remedy is to underexpose the picture slightly A great deal of harm has been done by unthinking writers who have said, "When in doubt, with negative film, overexpose a trifle, with reversal film, underexpose a trifle" The fact of the matter is that with either film the best results are secured through a slight underexposure, especially since, with negative, the tone and density of the resultant print can be controlled in the printing

A further aid in overcoming the grain with negative film is the use of the "Non-Halation ' or ' Greyback" type of film

A number of people have stated that the use of color filters with negative film increases the grain This is not so; they are mistaking an incidental for the cause of their troubles As has just been pointed out, it is overexposure that so increases the size of the grain that it becomes objectionable What has caused these good people trouble when they have attempted to use filters is the fact that they have not calculated correctly the increase in exposure demanded by the filters; they have erred on the side of overexposure, and accordingly burst the silver particles until they became evident on the screen No, if filters are properly used they cannot create grain I recently saw a most interesting reel of filter tests,

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Making Motion Picture Film

(Continued from Page 17)

picture art—possible The silver bromide and other silver salts of the emulsion are very much more sensitive to light than the silver nitrate from which they are derived Silver nitrate is therefore merely a raw material for the emulsion-makers when they carry out the next stage of making emulsions, but the care taken in making silver nitrate, so briefly sketched here, assures the emulsion department that its most important raw material is reliable

Tall chimneys are necessary—366 feet tall in our typical plant—to carry any fumes and soot high into the upper air whence they will blow away far from the manufacturing confines. Fumes evaporated off in the process of making silver nitrate are thus disposed of Similarly, what soot leaves the power houses after efficient burning of the daily 500 tons of coal goes into the chimneys

Well are these precautions, for no man in this very large industry knows which particular ten or twenty feet of negative may catch the "shot" of a lifetime Even if it were not of paramount importance to have the many millions of feet running through studio cameras and theater projectors perfect it would be necessary to take unlimited pains to avoid flaws if only to be sure that the film should not fail the great opportunity that may come to a cameraman only once in a lifetime—perhaps a unique news scene, or a hazardous plane crash by a double, or even the record of a fleeting glance that wins the public to some sensitive star

How the film industry has progressed in its safe-guards for film cleanliness and quality and stability may be observed in the department of our typical plant where the emulsion is coated on the transparent, flexible film base There may be veterans still active in the motion picture industry whose memory extends back far enough to give them perspective on the resulting film improvement

For something like ten years after George Eastman began the manufacture of film in 1889 the process was to form the film base, and then to coat it with the emulsion, on a long plate-glass table It is obvious, in these days of 1000-foot reel lengths, that 1000-foot tables would be impractical, but the machine age of film-making has conferred much greater benefits than the additional lengths possible The close control of the emulsion coating process resulting from continuous machine operation has been important principally in yielding more perfect film In other words, control of the conditions, including atmospheric conditions, under which the emulsion is applied to the film base is a positive manufacturing factor in addition to its perhaps negative importance in keeping anything from going wrong

In the glass-table stage of film manufacture whatever air happened to be in the room was good enough to dry the film regardless of dust or the weather outside—with what results in the way of perfection most of us can remember from the nickelodeons Now, instead, an elaborate and modern system admits to the coating machines only air that has been washed, filtered, and brought to exactly the proper temperature and the right degree of moisture content The enormous refrigeration plant of our typical film manufactory is important in doing that

In the interest of cleanliness even the many miles of copper air ducts in the basement below the emulsion coating machines are frequently flushed and polished and the air comes into the system through filter bags.

Machine attendants of course wear white laundered suits and caps These rooms, where daily miles of film are coated in the dark, are cleaner than hospitals or bakeries, to say nothing of other industries where daylight penetrates

Motion picture film is 35 millimeters wide That sounds simple enough, an absolute fact and so it is Projectionists need not concern themselves about it But an exact film width is not heaven-sent, any more than money grows on trees If the film were not exactly 35 millimeters wide—any foot of it—there would be no insurance against trouble in the projectors Somebody in the typical film manufactory had to worry about the width or projectionists would be worrying instead

Leaving out of consideration the history of how the 35-mm. standard was set, we shall find by inquiry that cutting the film to the prescribed width once was a major problem—until it was solved Like a thousand other details in making film, which is probably the most delicate product manufactured on a huge modern scale, the problem of exact-width slitting was solved and became just one more factor in justifying the adage that "trifles make perfection."

How this particular problem was solved suggests a visit to another interesting department of our typical film plant of 75 major buildings and 400 acres Slitting machines sufficiently precise could not be bought so they had to be made

Film-making was a mechanical art as soon as it was a chemical art Mechanical ingenuity, plus a very large and elaborate machine shop employing extraordinarily skilled mechanical craftsmen, turns out special film-making machinery for this typical film manufactory on a scale commensurate with the mighty mileage of film put forth

Micrometrically accurate machines to slit wide bands of film off the emulsion coating machines into unvarying 35-mm widths are only one of the mechanical products of a machine-making department that loses its identity in the necessary general perfection of the raw material for the motion picture industry The phenomenon of a highly mechanical industry buried within a chemical industry is matched by the strange realization that many of the resulting machines perform their operations in darkness

Perforations along the edges of motion picture film are only perforations to the men who use the film, but, to the mechanical minds and hands employed in making perforating machines that will clip, clip, clip, in darkness, putting perfectly accurate perforations on thousands of film miles, the modern apparatus represents many years of patient improvement

And ever the vigilant watch for a speck of dust or a pin point of grease on the film continues

It is of such detailed care—of which one can safely estimate 97 per cent even of the technical readers of this article never have heard—that film-making is made

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New 16 MM. Camera

(Continued from Page 11)

simultaneously with the Ciné-Kodak Eight They will be Models 20 and 60

The Kodascope Eight Model 60, is equipped with a 100-watt pre-focussed projection lamp with a decentered filament An efficient optical system gives brilliant pictures on the 22 by 30 screen The projection lens has a focal length of one inch A high-speed motor-driven rewind requires no changing of belts or reels, and provision for plugging in a table lamp to turn on automatically when the projector is turned off, are other features

The Kodascope Eight, Model 20, also has a one-inch lens It is equipped with a dependable lamp for adequate illumination The size of both projectors permits very easy carrying

As in the case of full-width 16 mm movies, titles will be available for splicing into film exposed in the Cine-Kodak Eight Miscellaneous successful professional motion pictures for showing with the Kodascope Eight also will be prepared, under the name 'Cinegraph Eight" Further information regarding this new camera and projector may be obtained by writing the Eastman Kodak Company at Rochester

The Elements of Makeup

by **JAMES BARKER**

Makeup Department R K-O Studio

WHEN the amateur cinematographer undertakes the production of films more pretentious than ordinary animated snapshots, he frequently finds that his people do not photograph as well as they should Accordingly, he blames his photography; yet nine times out of ten, it is not the photography that is at fault, but the fact that he has overlooked the vital factor of makeup For makeup is to cinematography what retouching is to still portraiture it serves to conceal facial blemishes, to enhance the effectiveness of attractive features while "dressing up" the less attractive ones, and to give the player a smooth, even-textured complexion of exactly the right tone and contrast to suit the natural coloring of hair and eyes So great is the importance of makeup in professional motion picture production that every studio maintains a large department exclusively devoted to makeup, and, before the actual start of each production, photographs many thousands of feet of makeup tests to ensure absolute perfection of this detail

To the amateur producer, the subject of makeup is of even greater importance The amateur does not have, as a rule, anything remotely approaching the resources of either skill or material that the professional can bring to even the smallest production I realize that many amateur cinematographers are remarkably expert, but even so, they do not have either the equipment or the long years of experience which enable the professional cinematographer to control his lighting—both indoors and out—in such a way as to minimize the facial blemishes of his players, and make them photograph the most effectively Not one amateur in a hundred uses reflectors on his exterior scenes, or possesses more than three or four lighting units for making interiors Of course, exteriors can be made without reflectors, and interiors can be satisfactorily illuminated with only a few lights· but in neither instance can there be any attempts at modelling—at using the lighting not merely to make an exposure possible, but to make the players photograph most effectively Therefore, makeup is mandatory

Unfortunately, however, very few amateurs have much of an opportunity to learn anything about motion picture makeup Women, of course, inevitably know more or less about the application of makeup for daily wear but that is an entirely different thing from theatrical or motion picture makeup In places where one can recruit one's cast from players in the Little Theatre groups, one can expect at least some understanding of stage makeup but though this is closely akin to screen makeup, it is still by no means the same thing It is, therefore, the purpose of this series of articles to briefly explain the use and application of makeup, both for straight and character parts

Of course, makeup, being a distinctly individual thing cannot be absolutely standardized, nevertheless experience has given us certain basic principles from which to work

In the first place, we have learned that the general tone of the makeup must offer a definite degree of contrast with the natural coloring of the player If the player is a brunette, the makeup required is not—as one might suppose—a predominantly dark one, but a light one, in order to display the dark hair and eyes to their best advantage Similarly, a blonde requires a comparatively dark makeup, not alone to accentuate the blondeness, but because the cinematographer almost always lights blondes in a higher key than brunettes, using "hotter" back-lighting and consequently a more intense front lighting in order to balance things Similarly, men require darker makeups than women.

Although the amateur pays far less attention to the key of the lighting than does the professional, it must be observed that if one works in a relatively low key, he will get the best results if the players are made up relatively light, this lighter makeup compensates to some extent for the lessened intensity of light—particularly front light—used By the same reasoning, if one works in a higher key, the players will require darker makeups to balance the greater intensity of light used

Similarly, the makeup must be balanced to the type of film used Of course, in professional work, Super-Sensitive Panchromatic film is used almost exclusively The amateur, on the other hand, is rather prone to use the less expensive types, reserving the Super-Sensitive film for interiors almost exclusively Professional experience has shown that this is not the best policy, but, so long as scenes made on the different types of film are not too closely intercut, it is possible to compensate to some extent by the use of different makeups It is never advisable, however, to attempt to use both Ortho and Super-Sensitive Pan in the same picture, for although the faces can, by means of different makeups, be made to photograph almost uniformly, the different color sensitivity of the two emulsions will make costumes, etc , photograph quite differently.

Fortunately, the various manufacturers of makeup materials have agreed upon a standard series of designations for the different shades of grease-paint, powder, lip-rouge, etc , and have further standardized their products so that the different components which are normally used together all bear the same number If, for instance, the grease-paint which forms the base of a makeup is that termed No 24, the other essentials—powder, etc —will bear the same number The numbering is further arranged so that in every case, the lower numbers designate the lighter shades, while the higher ones denote the darker shades

Taking the ordinary Panchromatic film as a basis, the standard makeup for women would be based on a No- 24 grease-paint, and for men on No 26—two shades darker The compensation required for the darker makeup of blonde women is not a complete change of makeup, but merely powder one shade darker than the grease-paint used The makeup products used must of course be of the newer series known an ' Panchromatic Makeup," which is of an entirely different shade from either the earlier screen makeup, used with Ortho film, or stage makeup

The use of the faster "Super Sensitive" film naturally changes the makeup somewhat We have found that the added sensitivity of the emulsion has the same effect as the use of more light Therefore the makeup must be darker than for ordinary Panchromatic film Taking again as our basis the No 24 makeup for ordinary Pan, we must, when we use Super Sensitive film, darken the makeup two shades In other words, our standard for Super Sensitive film will be a No 26 for women, and a No 28 for men By remembering this, it is relatively easy to balance the makeups to enable the use of Super Sensitive film for interior scenes and regular Panchromatic for exteriors

If on the other hand, one wants to use the old Orthochromatic film, one must also take into consideration the radically different color-sensitivity of the Orthochromatic emulsion, and the fact that the Panchromatic makeup materials are of a predominantly reddish-brown shade. Oddly enough, this dif-

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Wood-Watson 16 mm. Sound Printer

by **HAL HALL**

FROM H T Cowling, of Rochester, N Y, comes one of the most interesting, and perhaps one of the most important, announcements in the 16 millimeter field in months It is the announcement of the Wood-Watson 16 mm Sound Printer With the theatres giving thumbs down to advertising pictures and propaganda, the manufacturers have been turning to 16 millimeter to meet their needs, and the development of the RCA 16 mm Sound Reproducer stimulated interest in this field by those interested in advertising and promotional methods

The speed with which the 16 mm sound-on-film has been developed has done much to place the 16 mm size in the semi-professional field, and with 16 mm sound-on-film cameras about ready to be placed on the market, laboratories have been casting about in an effort to prepare for the developing and printing of 16 mm sound-on-film. The first demand is for an optically reduced 35 mm sound production to be reduced and re-recorded to fit the 16 mm sound-on-film projectors And while it is simply necessary to make a 16 mm reduction print from the 35 mm negative, so far as the picture is concerned, getting on the sound track is not so simple The best results are usually obtained by making a re-recorded 16 mm negative of the sound track, after which the sound track is printed by contact on the above mentioned reduced picture positive

However, since only acetate 16 mm raw stock is sold to the trade, the question of shrinkage during processing is of considerable more importance than with the 35 mm size, where nitrate raw stock is available to the trade Since the 16 mm sound-on-film projectors operate at 36 feet per minute as compared to 90 feet per minute for the 35 mm projectors or 2½ times slower, it must be remembered that the definition required for the 16 mm sound-on-film must be correspondingly greater The 16 mm sound track must be printed continuously, so that some method be devised to automatically compensate for the extreme shrinkage of the 16 mm acetate sound negative stock, at the same time taking care of the critical definition so essential to good results

It is in this connection that Mr Cowling, who is distributing the Wood-Watson 16 mm Sound Printer, claims that this printer solves the shrinkage problem Mr Cowling claims that the new printer compensates for this shrinkage

"This automatic shrinkage compensation is the basis for the entire design," says Mr Cowling, "and accounts for the superior results obtained on this printer In the old type sprocket printers the films, being of different lengths, were forced to slip past each other thus blurring the high frequencies and often introducing the so-called sprocket noise in spite of most careful adjustment In the Wood-Watson printer the shrinkage of the negative is automatically compensated to exactly fit the positive, and there is no tendency for the films to either creep or lose contact

"What at first appeared to be a very difficult process, now becomes simple and available to every laboratory Existing 35 mm sound films can be reduced to fit the 16 mm requirements Also, 35 mm silent films can be re-edited and adapted to the 16 mm sound projectors, either by preparing a 35 mm sound track negative and re-recording, or having a 16 mm sound track negative recorded direct for the silent production"

The illustration accompanying this article shows quite clearly the operation of this new printer The 16 mm sound negative is wound emulsion side out on one reel, and the positive film is wound on another reel, emulsion side in You place the 'start marks' together at left of sprocket, No 3, and close that gate Then, thread the positive around No 4 and No 5

The Wood-Watson printer

back to the right side of the sprocket Thread the negative around No 6 and No 7 under No 8 and No 9, then over No 10 and No 11 to the sprocket Pull up the positive until No 4 is vertical, and then pull the negative tight and back it off about 1/16 of an inch until it engages the sprocket teeth, and close that gate Thread the take-up reels and turn on the switch The operation of the printer seems quite simple, and if the claims of the manufacturer are to be considered— and coming from a man as reliable as Mr Cowling, they must be— this device should be of more than considerable interest to laboratories and those interested in 16 mm sound-on-film production It indicates that the 16 mm sound-on-film field has a future that may astound many of us with its enormity

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Debrie Reorganized Under H. R. Kossman

NEW York headquarters of Ande Debrie Equipment Manufacturing Co of Paris has been reorganized under the direction of H R Kossman A service department with a complete line of parts carried at all times, has been established at the New York address, 115 West 45th St Equipment manufactured by Debrie includes a full line of cameras, projectors, printing machines and sound equipment The products are widely used in European countries and are now being adopted on this side

Supersensitive for 16 MM.

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over-correction, it demands an increase of 12 times in exposure, however, as its principal use is in the making of night-effects, which depend upon a skillful combination of over-correction and under-exposure, in actual use it does not require such greatly increased exposures The exact increase for night effects can only be determined by experiment, and with reference to the exact effect desired

Kodacolor users are already familiar with the Neutral-Density filters These are rather useful in ordinary photography, not for controlling the exposure, as in Kodacolor work, but for reducing excessive contrasts such as those provided by glaring white pavements or buildings, or by the harsh white sand encountered at the beach or in the desert

To briefly summarize the matter whether or not you are accustomed to the use of filters, you will find the matter of learning how to filter Super-Sensitive film slightly harder than filtering ordinary Pan, but the results achieved will be well worth it, for the Super-Sensitive emulsion will not give you better results indoors, but outdoors as well When used with the proper filters—and these need not be many—Super-Sensitive film will give you a better, more natural picture, and enable you to get better pictures under unfavorable light conditions than can be hoped for any other way

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The Coming Eclipse

(Continued from Page 13)

a large image of the sun is desired and I suggest that a telephoto lens of from 12 to 20 inch focus be used As the passing of the eclipse consumes some two hours, it is advisable to speed up the first and last partial action by stop cranking so the action is more rapid on the screen About one frame every 15 seconds is ample The moment the sun is completely eclipsed the corona is visible and normal speed should be used Obviously, there is a tremendous change of exposure from the full, direct sun to the totally eclipsed sun when the light is only equal to about half moonlight Roughly, I suggest that the full sun exposure—using super-sensitive, anti-halo film, 170 degree shutter and 24 frames per second, and no clouds to obscure, would be about F 64 After the sun is three fourths covered by the moon, the lens is slowly opened up—however, bearing in mind that as long as any portion of the sun remains, it is intensely brilliant, and if over-exposed will "flare" so badly as to ruin definition

The moment totality occurs open the lens to its full aperture to catch the faint light from the corona and prominences After totality the sun begins to appear again and then the exposure is decreased in reverse of the first part of the eclipse I do not recommend filters as there is no need for their real purpose, and the added tendency of the glass to flare when used in this type of work might spoil a clear image In this connection it is a natural tendency of the lens itself to flare or give "ghost images" when such a contrasty object as the sun is photographed About the only remedy I know of is to keep the lens dead centered on the sun at all times during exposure

When the astronomers arrive at their eclipse camp to photograph the eclipse, all instruments are set up and carefully adjusted long before the date for the eclipse Sometimes weeks are spent in preparation Figure 5 shows the eclipse photographic camp equipment used by us in the 1930 eclipse In the foreground you see the spectroscope camera, the long, table-like contraption At left center is the heliostat, the mirror equipment upon which the cameras are trained In the background on the platform are seen frames of ground glass used in photographing the shadow bands In the astronomer's camp each member of the party drills constantly so that he will not make a mistake in carrying out his task when the eclipse comes Success lies in seeing that every possible chance of failure is eliminated At a certain hour, minute and second operations begin and every man must know just what to do and do it

This coming eclipse will be the last opportunity to view a total eclipse of the sun from the United States until August 21, 2017, so if you wish to photograph an eclipse this will be your last chance unless you travel many miles to do it

Author's Note: The sources used in preparation of this article are Dr Mars Baumgardt, Simon Newcomb in the Encyclapaedia Britannica, and "Eclipses of the Sun," by S. A Mitchell, published by Columbia University Press, which I recommend to anyone wishing to pursue the subject.

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Academy Considering Award for Short Subjects

FOLLOWING the announcement of the regular Academy Awards program for 1932, Chairman David O Selznick of the Awards Committee has announced that special awards of merit for the outstanding short subjects of the year are being contemplated by the Academy of Motion Picture Arts and Sciences A series of meetings of the various Academy members engaged in short subject production is now under way. Present plans indicate recognition of three basic classes of short subjects Mechanical Films, such as cartoons, etc., Novelties, and Comedies; although it is not expected that the entire series of awards will be duplicated for the short subjects

EQUIPMENT PRIZES . . .

to be given winners in the

AMERICAN CINEMATOGRAPHER

$1,000.00

Amateur Movie Contest

In addition to the four cash prizes, announced on the opposite page, the following prizes will be awarded by various equipment manufacturers and dealers:

The BELL & HOWELL COMPANY will also present two equipment prizes—First, a choice of a Filmo 70DA Camera, listed at $280 00, or a Filmo Model J L Projector, listed at $298 00 Second, a choice of any Standard Cooke Telephoto Lens, priced from $60 00 to $95 00 To be given to prize winners who made their pictures with a Filmo The EASTMAN KODAK CO will present a Model K Cine Kodak, with a f. 1. 9 lens, complete with carrying case, priced at $150 00, for the finest example of photography in an out-of-doors picture regardless of whether it wins a cash prize or not and without consideration of story subject MAX FACTOR MAKEUP STUDIOS will present one of the famous Max Factor Make-up Kits, completely equipped, to the winner of first prize of $500 00 HOLLYWOOD FILM ENTERPRISES, INC , offers a Model B Cine Voice, Home Movie Talking Picture Machine, complete with carrying case, priced at $129 00, to be given to that person or Amateur Club, located in California, who enters the best 16 mm or 9½ mm picture from California, regardless of whether the picture wins a cash prize or not In other words, the prize goes to California's best entry. This home talkie equipment may be attached to all projectors, either 16 mm or 35 mm It makes any projector a talking picture machine HOME MOVIE SCENARIOS, INC , offers two prizes as follows. To the winner of first prize of $500 00, one Scenario (choice of entire group), one H M S Matte-box, choice of any H M S Filter, and one H M S Scene Slate To the winner of second cash prize of $250 00, one H M S Matte-box and choice of any H M S Filter In case the picture winning first prize is made from an H M S Scenario, an additional cash prize of $100.00 will be paid by Home Movie Scenarios, Inc If second prize is made from an H M S Scenario, an added prize of $50 00 will be awarded, and an added prize of $25 00 will be given winner of third prize if made from an H M S Scenario METEOR PHOTOLIGHT COMPANY will present the winner of FOURTH cash prize the following valuable lighting equipment: A Meteor Double Photolight complete with two 500 watt NERON bulbs, retail price, $30 00, a Meteor Photolight Tripod model, complete with NERON bulb, retail price, $18 00, and a Meteor Photolight Table model, complete with bulb, retail price $13 50 Value of prize, $61 50

AND—MORE PRIZES WILL BE ANNOUNCED

YOUR OPPORTUNITY!

The AMERICAN CINEMATOGRAPHER now offers the greatest opportunity ever given the AMATEUR MOVIE MAKER to win recognition and cash. ¶ A total of **$1,000.00** in **CASH** prizes is offered by this magazine to the winners of the Amateur Movie Making Contest announced in the October issue. This contest is sponsored by the American Society of Cinematographers, an organization composed of the world's leading professional motion picture cameramen. If you want to win recognition, as well as cash, read the rules below and send your entry. (See opposite page for additional equipment prizes)

COMPLETE RULES OF THE AMATEUR MOVIE MAKING CONTEST

The American Cinematographer will present a prize of $500 00 for what its judges consider the best 16 millimeter or 9½ millimeter picture submitted in this contest $250 00 will be given as second prize; $150 00 as third prize; and $100 00 as fourth prize, a total of $1000 00 in prizes

This contest is open ONLY to AMATEURS No professional cinematographer will be eligible to compete It is a contest solely for the amateur, either the individual or the club

The contest officially opens November 1, 1931 The contest ends at midnight of October 31, 1932. All pictures must be entered by the closing date or they will not be considered Entries mailed or expressed bearing the date of sending will be accepted if they reach THE AMERICAN CINEMATOGRAPHER office after October 31, 1932, providing the date shows they were sent before midnight of October 31, 1932.

Pictures submitted in this contest will be judged upon photography, composition, direction, acting, cutting and entertainment value And only silent pictures will be eligible for the contest. The judges, whose names will be announced later, will include outstanding and widely known Cameramen, Directors, Actors, Writers and a group of nationally known Motion Picture critics from some of the best known newspapers in America

The decision of the judges will be absolutely final, and there can be no appeal from their decision Announcement of the awards will be made as soon after the close of the contest as possible and checks will be mailed the winners

Pictures may be submitted either by individual amateur movie makers, or they may be submitted by Amateur Movie Clubs However, they MUST BE photographed on 16 millimeter or 9½ millimeter film Accompanying each entry must be a sworn statement to the effect that no professional cinematographer assisted in the making of the picture No pictures will be accepted which were photographed on 35 millimeter film and then reduced to 16 millimeter.

This contest is open to amateurs and amateur clubs anywhere in the world, with the following conditions

Only Bona Fide Subscribers to the American Cinematographer Can Compete

If you are a paid-up subscriber to THE AMERICAN CINEMATOGRAPHER you are eligible to enter the contest If you are not a subscriber just send in your check for a year's subscription and you are eligible

In the case of Amateur Clubs the following rules apply:

If a club with a membership of 20 or less wishes to enter a picture, the club will have to have a minimum of 5 subscribers among its members Any club with more than 20 members will have to have a minimum of 10 subscribers among its members For any further information you may desire, write the Editor of the American Cinematographer, 1222 Guaranty Building, Hollywood, Calif., or consult your photographic supply dealer

IF YOU WISH TO ENTER THIS CONTEST AND ARE NOT A SUBSCRIBER, MAIL COUPON TODAY

American Cinematographer, 1222 Guaranty Bldg , Hollywood, Calif.

Enclosed please find Check, or Money Order, for $3.00 ($4 00 foreign) for which kindly enter my subscription to THE AMERICAN CINEMATOGRAPHER for one year:

Name .....

Address .....

It is understood that this subscription makes me eligible to enter your $1000 00 Amateur Movie Contest.

Cinematographer Contributor to Conduct Cinema Course

HARRY Alan Potamkin, a contributor to The American Cinematographer, former foreign correspondent for National Board of Review now member of Exceptional Photoplays Committee, National Board of Review, and correspondent for Close Up and other European film-journals, has been chosen to conduct a course on the cinema at the New School for Social Research, New York, this fall, beginning October Although previously the New School has had lectures on the film by Gilbert Seldes, Ralph Pearson, Alexander Bakshy and Terry Ramsaye, and a course was planned by Robert Milton, the director, before he left for Hollywood, Mr Potamkin's course will be a pioneer in this country in the consideration of the cinema on par with the other arts and sciences It will treat the film's prenatal days, its early history, birth in the laboratory and rearing in the counting-house, showmanship and international competition, the primitive film and basic principles, the progress of the motion picture as art, the social and political network in regard to the film, the various national cinemas (French, Swedish, American, German, Russian, Japanese, etc), the development of the 'compound cinema' of sound color, variable screen, stereoscopy, etc , censorship Special lectures will consider pivotal films, films of major importance in the movie's history, and the categories of the film of humor and animation Two of the lectures will be devoted to a critical presentation of a major silent and major sound film The progress of cinematography and the role of the camera will be examined Film-excerpts and representative speakers will accompany Mr Potamkin's lectures, as will also other accessories. Entirely new data will be furnished the cinema student for his examination, and a bibliography of cinema literature will be suggested The aim of the course is to establish correct historical criteria for the cinema, but the seriousness, Mr Potamkin promises, will in no way oppress the pleasures of instruction

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Stolen From Universal

THE following pieces of equipment have been stolen from Universal Studios, according to Charles Glounar, head of the camera department Anyone locating these articles are requested to get in touch with Mr Glounar They are a 4 x 5 Eastman Graflex camera, No. 173715, with Kodak Anastigmat lens, No 338599 Also two 1000-foot film magazines Nos 361 and 385, containing 1955 feet of raw negative stock

Eastman Absorbs Tax

THE Eastman Kodak Company has announced its decision to absorb the 10 per cent tax on the sale of cameras fixed by the new revenue law The company will pay the tax on all Eastman cameras sold but will not bill its dealers for the amount of the tax. Eastman camera prices will therefore not be increased to the dealers or to the public.

An officer of the company made the following statement in explaining the tax decision- "Last winter the Kodak Company announced that in the film sizes that are in almost universal use there was the equivalent of a 25 per cent reduction in price brought about by furnishing an eight-exposure roll at the former price of a six This was a step in the line of keeping one of the most delightful of pastimes on an economical basis where everybody could enjoy it.

"Now comes similar action along the same line. The Government has placed a 10 per cent tax on cameras, along with the tax on the other goods used on outings But as 'all outdoors invites your Kodak,' the company is not going to have anything interfere with that invitation It is going to absorb that tax There will be no increase in price to the customer "

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Rodent Robbers Are Villains in New 2-Reel Motion Picture

THE prairie dog and his cousin the ground squirrel are featured in a 2-reel motion picture just released by the U S Department of Agriculture These "cute little fellows," which scamper to cover in their underground burrows on the approach of visitors and then, curiosity overcoming fear, poke their heads over the edge and play hide and seek with the strangers, are shorn of their cloak of harmlessness and shown up for what they are, the rodent robbers, in the film "Routing Rodent Robbers "

◆

Camera Movement

(Continued from Page 14)

The introductory analysis shows the great variety of possible technical use and effects of camera movement The following short study shows part of their dramatic possibilities and also the dangers of their promiscuous application without careful study of their effects upon the public

Camera movements have inherent and potentially great dynamic powers for the improvement of motion picture effects in the hands of a careful man, but may become dynamite in the hands of the careless Such carelessness is usually of a two-fold character First, the temptation of using novel effects often prompts the director to over-do their use in one picture, or in one scene. Such over-use can be called psychological carelessness Practice so far has shown that a few well executed short camera movements are more effective than a number of them, especially when of long duration and not well conceived for dramatic climax

Secondly, it is carelessness in its worst type if the director does not painstakingly discuss an intended camera movement with the cameraman who is not simply controlling the mechanics of the moving camera, but has to study the possibilities of set construction, its contrasts and the relative photographic values of set and costume designs and colors under changing camera-angles, following each other during a camera movement They all influence lighting, which is, even without camera movement, a delicate art, and it certainly takes a master in lighting to maintain the desired mood and photographic excellency for camera movements as now achieved for the fixed camera work It is the cameraman who should be consulted before a camera movement is decided upon, because it is only he who can give sparingly used camera movements their pictorial and dramatic value which makes them an appeal to mass psychology

Combining Leica and Eyemo

CLIFF THOMAS, President of the Hollywood Camera Exchange, has devised a unique method for making both moving pictures and still pictures with one set-up Mr Thomas wanted to have a one-man outfit for use in making both stills and movies of the various events at the Olympic Games, so he just clamped his new Model D Leica to his Bell & Howell Eyemo 71 C, which is equipped with a 400-foot magazine, motor and battery box With twenty feet of cable connected to the battery box, the operator has plenty of freedom in moving about, and at the same time he is able to secure stills while making his movies All he has to do is press the button starting the motor of the Eyemo, then he snaps his stills while the Eyemo is doing its stuff. A number of Hollywood camera enthusiasts have had the Hollywood Camera Exchange provide them with the same equipment

◆

Bausch & Lomb Executive Selected for M. I. T. Board

M. Herbert Eisenhart, vice-president and general manager of the Bausch & Lomb Optical Company of Rochester has just been elected to a five year term on the board of the Massachusetts Institute of Technology Mr Eisenhart graduated from M. I. T. in 1907, previously having received the degree of B S in Princeton in 1905 A native of York, Pa, he came to Rochester in 1907 to accept a position in the chemical laboratory of the Eastman Kodak Company He became assistant superintendent and then superintendent of this division

In 1917 Mr. Eisenhart became associated with the Bausch & Lomb Optical Company as production manager In 1926 he was elected assistant general manager and in 1929 vice-president and general manager.

Developer Formulae

MANY requests have been received from readers for developer formulae for both negative and positive stock. The following information should be of considerable value to those readers Herewith are two developers for negative stock and two for positive stock, as given by the two largest film manufacturers in America These are given in their metric form, with the following simple rule for conversion U S pounds and gallons —Using 120 (U S) gallons of water, just substitute pounds for grams in the chemicals used If you use only 7½ (U S) gallons of water, substitute ounces for grams in the chemicals.

Negative Developer

No. 1

Elon (Metol)	1 5 grams
Sodium Sulphite	100.0 grams
Hydroquinone	4 0 grams
Borax	1 5 grams
Water	1 0 liter
Temperature	65° F or 18 3° C

No. 2

Metol (Elon)	2 5 grams
Sodium Sulphite	75 0 grams
Borax	5 0 grams
Water	1 0 liter
Temperature	66°F or 18.9° C

Positive Developer

No. 1

Elon (Metol)	. 5 grams
Sodium Sulphite	.30 0 grams
Hydroquinone	3 3 grams
Sodium Carbonate	20.0 grams
Potassium Bromide	1 5 grams
Water	1 0 liter
Temperature	65° F or 18 3° C

No. 2

Metol (Elon)	7.5 grams
Sodium Sulphite	24 0 grams
Hydroquinone	. 3 21 grams
Sodium Carbonate	21 0 grams
Potassium Bromide	0 5 grams
Water	1 0 liter
Temperature	68° F or 20° C

◆

Using 16 MM. Negative Film

(Continued from Page 33)

photographed on 16 mm negative and reversal films by William Stull, A S C, the Associate Editor of the magazine In these tests Mr. Stull used almost the complete range of professional filters—including many far heavier than even the advanced amateur would ever use—and in no case was the granularity objectionable But he has confided to me that his first experiments with this type of film—before he had proved to himself that a slight underexposure was vital to success—were unpleasantly grainy, whether or not a filter was used And I cannot better sum up the matter than did Mr. Stull when I asked his advice preparatory to my own first attempts with 16 mm negative "Handle it just as you would any other 16 mm film of corresponding sensitivity—be extremely careful when loading or unloading, for the opaque film leader is not so sure a preventive of edge-fog as is the customary black paper—keep your exposures well down—and you'll be all right " I did—and with such success that from now on—I'm using negative for my 16 mm. work "

Independent Grocers Go In For Talkies

AN INDUSTRIAL talkie has just been produced for the Independent Grocers Alliance of America by the Burton Holmes Studios, Chicago. The talkie consists of three related pictures and totals approximately 14 reels. It will be shown to wholesale and retail grocers and manufacturers to the number of more than 25,000 in 47 conventions across the country. A Bell & Howell Varo lens was used for zoom shots—the first time in industrial work.

A Burton Holmes crew photographing grocery store interior

The Varo lens is said to be particularly valuable for quickly establishing locale, background, etc., and then emphasizing certain parts of the vocal dialog. It permits zooming up to a character speaking his lines and concentrating attention on the important action of the scene. When the speaker's verbal point has been established in a close-up, zooming back without interruption to the original scene reestablishes the background. The lens affords a tremendous saving in film footage, as well as effecting a smooth transition from one scene to another. This transition feature is particularly important when shots are being made from points where it would be impossible to obtain the effect of approaching or zooming up to the subject by any other means.

◆

New Film on Mechanical Drawing

THE first educational motion picture made expressly to teach Mechanical Drawing was recently produced in San Diego, California, by Floyd W. Cocking of the Roosevelt Junior High School, as author, and James E. House of the Visual Education Department of that city, as director. It is a 16 mm. of 480 feet, or about 20 minutes running time.

Here is an excellent example of truly educational film made by educators themselves, with nothing more elaborate in the way of equipment than a Filmo Camera and a regular drawing outfit.

The film gives brief correlation of drafting to industry and then takes up the study of drafting by means of photographed demonstrations showing the use of instruments, drafting technique, layout of a plate, choice of views in drafting, and the actual construction of typical drawings.

During a recent review of this film in the Bureau of Visual Instruction of the Chicago Public Schools, the opportunity was presented to test the reaction not only of the instructors present, but also of several junior high school boys. From the comments of the boys while the film was being shown, it was evident that even in such a short and condensed presentation, knowledge was acquired in a most interesting and effective way. The method of sharpening the pencil, the determining of the location of a line to be drawn by placing the pencil point and then bringing the angle ruler up against it, and similar points, were vividly described by the boys after the film had been shown.

Amateur Movie Making

(Continued from Page 30)

table, and then quickly and accurately assemble them on a reel When I am cutting a scenic film, I frequently carry this idea one step farther, and take the scenes which have no definite place in the continuity and assemble them together in a utility reel, then, when I find that for some reason or other I need a scene or two to round out the continuity, or to space titles, or anything of the sort, I have this utility reel of surplus footage at hand, ready to project, thereby simplifying matters considerably

Once the scenes have been roughly assembled, the picture should again be projected This time, study it to see what can be eliminated, and what added Study it for tempo, see if you can aid the tempo by further cutting Cutting, by the way, is one of the most important factors in determining the tempo of a completed picture Short scenes, with frequent cuts, accelerate the tempo, long scenes, with few cuts, slow it down

Lastly, project the film again, and look for detail, mechanical imperfections—bad frames, poor splices, etc Eliminate these —and your picture should be complete

Above all, remember that it is in the editing that the final touches of originality can be shown Study the professional productions of such artists as Rouben Mamoulian, Lewis Milestone, Ernst Lubitsch, Rene Clair, Sergei Eisenstein, and Fritz Lang All of these men are artists of the highest order, they almost invariably provide an abundance of original touches in direction, cinematic treatment, and photography but most individual of all is their arrangement—or editing—of the completed picture Each of them personally supervise the editing of their pictures, realizing that commonplace editing can obliterate all of the individuality they have striven to build up in the previous phases of production Therefore, if you have worked hard to make the photography, direction and general production of your picture outstanding and original, do not forget that the picture must be edited sympathetically, carrying out the same treatment from start to finish No picture can be more original than the mind of its editor

◆

New Leica Shop in Hollywood

GILBERT Morgan has just opened a Leica department in the Sunset Camera Shop, 6305 Sunset Boulevard, Hollywood, where he has on display a complete line of the latest Leica cameras and accessories In addition to handling cameras, lenses and equipment, Mr Morgan is prepared to supply Leica owners with any amount of 35 mm film in short end lengths As some Leica owners have had difficulty in securing this film in the required lengths, Mr Morgan's service should be of considerable value Mr Morgan also is specializing in fine grain developing and finishing of film.

For the past year Mr Morgan has been associated with the E Leitz Company, both in Hollywood and New York, giving lecture demonstrations and working in the research department

AMATEUR Club Activities

Greenbrier Amateur Movie Club

MEMBERS of the Greenbrier Amateur Movie Club, of White Sulphur Springs, West Virginia, are eagerly awaiting reports from England where their latest production, "Black Door," is now being screened for the British amateur enthusiasts All who have seen this picture in America have praised it highly, declaring it to be one of the best examples of amateur club pictures yet produced Hal Morey directed and photographed the picture In the cast were Lucille Dixon, Catherine Preston, J M Gaston, R H Patterson, Herman Rieger, L R Johnston, George O'Brien, W B Hines, Captain V. Yavorsky, William Perry and Robert Parker The Greenrier club is entering a picture in the AMERICAN CINEMATOGRAPHER Amateur Movie Making Contest, and while the decision has not been made, it is expected that this picture will be the one entered

◆

Milwaukee Movie Makers

ANOTHER club that is working on a picture to enter in the Amateur Movie Making Contest of the CINEMATOGRAPHER is the Milwaukee Movie Makers, of Milwaukee, Wis This organization is making a yachting picture which is titled, "Yo-Ho," and latest reports are to the effect that much progress has been made and that there are some exceptional scenes in it

◆

Los Angeles Amateur Club

BILLY Burke of the Billy Burke Home Movie Studio, Los Angeles, was host to the Los Angeles Amateur Cine Club at this organization's July meeting, held at the Bell & Howell Auditorium on July 11th An unusually fine meeting resulted Mr Burke had the cooperation of a group of Los Angeles and Hollywood dealers consisting of the following- Phil Meisenzahl, Bob Robinson, Bill Winters, Al Kerkhoff, George Sherlock, Ray Sebastian, Hatto Tappenbeck, Roland King and P Iwata These dealers provided a reel each of interest film for the evening showing.

◆

Bergen County Cine Club

A GROUP of fifteen home movie enthusiasts, of Englewood, New Jersey, have formed the Bergen County Cine Club Leaders of several amateur clubs located in Northern New Jersey attended the organization meeting and gave valuable advice Oscar C Bucheister, President of the Cine Craft Laboratories, 158 South Van Brunt Street, Englewood, offered the club the use of his firm's projection theatre for a meeting place which the new club gladly accepted

◆

The Elements of Makeup

(Continued from Page 35)

ference in color-sensitivity affects the makeup exactly as though it were an increase in speed Therefore, when using Ortho film the basic makeup should be a No 28 It is really hardly worth while to use Ortho, however when the regular Panchromatic film is so cheap, besides, the full beauty of an exterior scene is lost if you do not have a panchromatic emulsion which will portray the color-contrasts of costumes, foliage, etc —to say nothing of cloud-effects—in their true relationship

(EDITOR'S NOTE: In the following articles Mr Barker will discuss in detail the application of makeups, describing and illustrating the various stages.)

Announce 1932 Academy Awards Program

CHAIRMAN David O Selznick of the Academy's 1932 Committee on Awards recently announced the complete program for the selection of the Academy's annual awards for achievement in the various phases of motion picture production Several notable changes are noticeable in this year s program, especially in the technical awards The most noteworthy change is an improved method of making nominations for the technical awards, the nominations being made by the various sub-sections of the technicians branch whose members are experts in the especial phase of production for which the award is made For example, nominations for the Cinematography Award will not, as in the past, be made by the entire technicians' branch, which is composed of Art Directors and Sound Men as well as of Cinematographers, but by the Photographic Section alone

A further improvement is noticeable in the restrictions seeking to limit the photographic award to bona fide examples of commercial production The rules governing this year's Cinematography Award specifically state that "Only black-and-white pictures photographed in America under normal production conditions shall be eligible for the Cinematography Award, others may be eligible for Special Awards" These restrictions, together with the new method of making nominations and the fact that all nominating and voting is by secret ballot, promise even greater impartiality and fairness for this year's awards than in the past

As has been the custom in the past, the awards will be announced and bestowed at a special Awards Banquet, which will be held November 10

Where to Buy the American Cinematographer

● The following dealers sell this magazine each month If you wish to find reliable dealers visit these.

Almer Coe & Co 105 N Wabash Ave, Chicago Illinois
Anderson Supply Co 111 Cherry St Seattle, Wash
Associated Film Libraries Inc Suite 224 State Lake Bldg, 190 N State St, Chicago Ill
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California Camera Hospital 321 O T Johnson Bldg Los Angeles, Calif
Central Camera Co, 230 So Wabash Ave Chicago Illinois
Crowley Milner & Co, Motion Picture Dept Detroit Mich
Wm C Cullen 12 Maiden Lane New York N Y
Detroit Camera Shop, 424 Grand River W Detroit Mich
R M F Electrical Supply Co, 430 Massachusetts Ave, Cambridge A, Mass
Gillette Camera Stores Inc, 117 Park Ave, New York City N Y
The Gross Photo Supply Co Retail Dept Toledo Ohio
Edwin A Hahn 223-225 Columbia St, Utica, N Y
Francis Henricks & Co, Inc 339 So Warren St, Syracuse N Y
Heraco Exchange Inc 611 Bergenline Ave Union City N J
Harvey & Lewis Co, 1503 Main Street Springfield Mass
Harvey & Lewis Co, 513 Main St Worcester, Mass
Herbert & Huesgen Co, Motion Picture Dept 18 E 42nd Street, New York City N Y
Hirsch & Kaye 239 Grant Ave San Francisco Calif
Hollywood Camera Exchange 1600 Cahuenga Ave Hollywood Calif
Hollywood Citizen, Camera & M P Dept, 6364 Hollywood Blvd, Hollywood Calif
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◆

Kodacolor for Victor Cameras and Projectors

THE Victor Animatograph Corporation announces that Kodacolor is now available for all Victor Cameras and Projectors

Kodacolor equipment for the Model 3 and Model 5 Victor Camera consists of the Hugo Meyer F 1 5 1" Kino Plasmat lens equipped with the Kodacolor Filter Assembly The Victor Corporation advises that Hugo Meyer F 1.5 Kino Plasmat lenses now in use by Victor owners should be returned to the factory for fitting of the Kodacolor Assembly to obtain the best results. The new type of Kino Plasmat lens now being supplied by Hugo Meyer is fitted with a special Kodacolor Filter Assembly at any time desired without special factory fitting

The Hugo Meyer Kino Plasmat is said to be one of the finest lens equipments available for natural color photography, due to the fact that its elements are highly corrected for all of the primary colors of the spectrum The lens can, of course, be used also for black and white photography On interior work and scenes made in poor light, deep shadows, etc , the speed of F 1 5 offers a tremendous advantage, as this speed is more than 60 percent greater than that of the F 1.9 lens generally employed for Kodacolor.

Kodacolor equipment for the Victor Projector will consist of a special lens equipped with the Kodacolor Projection Filter Assembly. The lens because of its special construction for color projection is not intended to replace the regular Victor lens supplied for black and white projection

Kodacolor Assemblies for both Victor Cameras and Victor Projectors will be available through all authorized Victor distributors and through the Victor factory at Davenport

◆

Cinematographers and Directors Meet

(Continued from Page 10)

Director James Whale then explained that he thought that the only time a trucking shot should be used is when it increases the value of the picture; but he added, "I realize that these cameramen are masters of their art, and I always consult with my cameraman before deciding on any shot If he objects and shows me that I am wrong I hastily take his opinion and follow his advice."

All in all the meeting and discussion served an excellent purpose, for it at least, started discussion and thought and promoted a greater feeling of cooperation between the cameramen and the directors No doubt, out of this meeting will grow a more intelligent use of these moving shots, and it is hoped a betterment of motion picture photography.

Following the discussion Karl Freund's "Berlin" and the UFA production, "Congress Dances" were shown

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BRULATOUR BULLETIN

What's What EASTMAN FILMS *Who's Who*

WARNER-FIRST NATIONAL STARTS BIG PUSH

RUMORS and counter rumors notwithstanding there's plenty of activity in the great nest that forms the base of Dark Canyon in Burbank. Warners have made a welcome move. Production is under way for a busy season. Carpenters, painters, electricians, actors, directors AND cameramen are hearing the long waited buzz of their phones calling them back to their work. An ambitious program started this week when Sol Polito was called to make tests of Patsi Munt who will star in "I'm a Fugitive." They start to roll 'em on Saturday morning.

Jimmy Van Trees gets the second call for the Al Green production "Silver Dollar," which starts shooting the first of the week.

Bun Haskins is shooting atmosphere stuff in New York for "Central Park," which is Number Three on the Warner schedule.

Two more set to go before the fifteenth of the month and from that time forward the old Brulatour trucks will be unloading at Milton Cohen's front door and—who says "There ain't no Santa Claus."

"Bring 'Em Back Alive"

No good cameraman ever dies in the memory of Hollywood producers. Proof? — Plenty. — Bert Glennan stepped away from his camera and took up (with emphatic success) the megaphone a few years ago. Now he's dropped the mouthpiece and taken his turn with the lights again and you'll find he has kept right on his pictorial toes when you see the newest Josef Von Sternberg production, "Blonde Venus" with la Dietrich. Bert's second is Fred Mayer. Neil Beckner, assistant.

Olympic Luncheon—

Russia won first honors (the check) in the Olympic Classics of Lab superintendents when Mike Leshing (Fox) tendered a luncheon to his fellow craftsmen at Cafe de Paris (Movietone City) last week for no other good reason than to tell a brand new story about the traveling man and the farmer's daughter. The color scheme was in keeping with the Olympic motif (red, white and blue)—red were the roses in the gigantic table centerpiece—white (as the snow) was the gleaming linen—and blue (of course you dope) were the other lab superintendents when they thought of the social obligation of following Mike's act. Those who went indigo—John Nickolaus (M G M), George Seid (Columbia), Roy Hunter (Universal), Harry Ensign (Paramount), Charlie Levin (Roach), Jack Guerin (Consolidated), Henry Goldfarb (Fox), Eddie Hansen (Fox sound), Emery Huse (Eastman), George Gibson (Brulitor) and Ye Ed who right here and now pledges the next host twice this space if he tops Mike's menu. (Note—To the chef of Cafe de Paris—Siluti.)

Congratulating Cronjager!

Another plum in the pie of Eddie Cronjager. Just this minute got the assignment as number one boy on the William Wellman (RKO) production co-starring Richard Dix and lovely Ann Harding. "The Conquerors." Associated with Mr. Cronjager on this big feature is Bob DeGrasse (who won the newspaper raves on the British picture made by Rowland V. Lee, "The Sign of Four")—Bob has the second berth while George Diskant is the assistant. Cronjager has turned in an enviable record this year and richly deserves this splendid assignment.

Milner With Lubitsch—

With the final scenes in the can on Chevalier Paramount production "Love Me Tonight," Vic Milner got all set to show the boys from other ports just what a Hollywood sailor in action looks like—his little old boat tuned up and ready to go when—Bingo—one more entrant out of the Olympics—Reason why—because that wise showman Ernst Lubitsch gave Vic the wiggle of the finger and pulled him out of the cock pit back to the set where they are now readying to start the new important opus. Vic's seconds are Bill Rand and Bill Mellor and his assistants Guy Roe and Lucien Ballard.

Dave Able Returns

Back from his vacation in Montreal, Dave Abel is supervising the photography of the George M. Cohan picture "The Phantom President" at Paramount. His second is Ernest Lazzlo and assistant Jimmy King.

Kurrle's Vacation Cancelled

Bob Kurrle was the recipient of an unusual cut. His vacation from Warner First National promised him play time to about the middle of August. Along came William Sistrom (World Wide) and changed Bob's mind and schedule. "Lucky" Humberstone is directing. "The Crooked Circle" and Bob is directing the lighting while Red Greene and Johnny Shepek are doing the hard work.

Art Miller Finishing

Artie Miller is winding up photography at Universal on O K U S A and is standing by for an assignment which has been extended by another major studio.

Lang on "Farewell"

Charlie Lang just can't get a day off. Paramount KNOWS the boy's good. A solid year of keeping busy at ONE studio in these times speaks volumes for any cameraman. Lang drew the assignment for the special "Farewell to Arms" which will be directed by Frank Borzage. Bob Pittack and Cliff Shirpser are Lang's associates.

Hello, Broadway

George Folsey just got his lungs nicely filled with our low fog (after yeahs and yeahs of Noo Yawk) and started his first coast Paramount picture "The Big Broadcaster" only to be told that the picture will be finished in New York. George is packing his trunk and washing the faces of Guy Bennett, his second, and Tommy Morris, his assistant, to take them all bye bye to Broadway.

Marsh for Marion Davies

Olite Marsh just completed his camera work on "Father and Son" for M G M and was immediately reassigned to "Blondie of the Follies" with Marion Davies when George Barnes who was taken seriously ill had to withdraw. Barnes is threatened with pneumonia. We add our hope to that of all other friends that George will beat the threat and shortly be able to resume work.

Garmes—"Smilin' Through"

Lee Garmes who won the critics praise for his artistry in Norma Shearer's triumph "Strange Interlude" now at Grauman's Chinese is in production with the same star at M G M on "Smilin' Through" which is being directed by Sidney Franklin. Les White and Slim Cruze are assisting Garmes.

Hickox at Radio

Sid Hickox is photographing "Bill of Divorcement" at Arkayo. His staff for the production is Eddie Pyle on second and Wesley Anderson and Charles Burke as assistants.

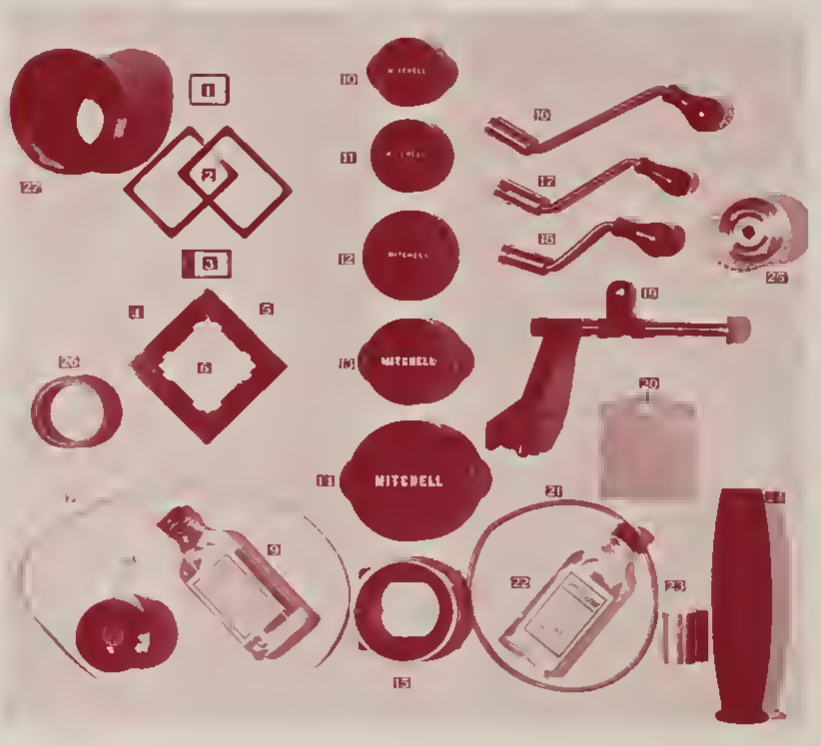
Lyons Finishing

Chet Lyons is winding up the photography of "Decency" for Equitable. Ray Ramsay is his second. John Van Wormser assistant.

The Editor Squawks

Add dirty tricks. Jimmy Howe took us to Chinatown to a fascinating little dump where he selected the most delightful dishes from a menu printed in zig zag Chinese. What food—gobs of it—Then came the check—(in good old Los Angeles American English) Jimmy simply couldn't read THAT. (Whisper—I've a date to take Jimmy to a corned beef and cabbage place owned by Mickey O'Toole—where the only waiter happens to be a China boy. Heh—heh—heh—!)

WE CARRY a large supply of standard camera parts and accessories, and in addition we are in a position to take care of your requirements for special items.



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